

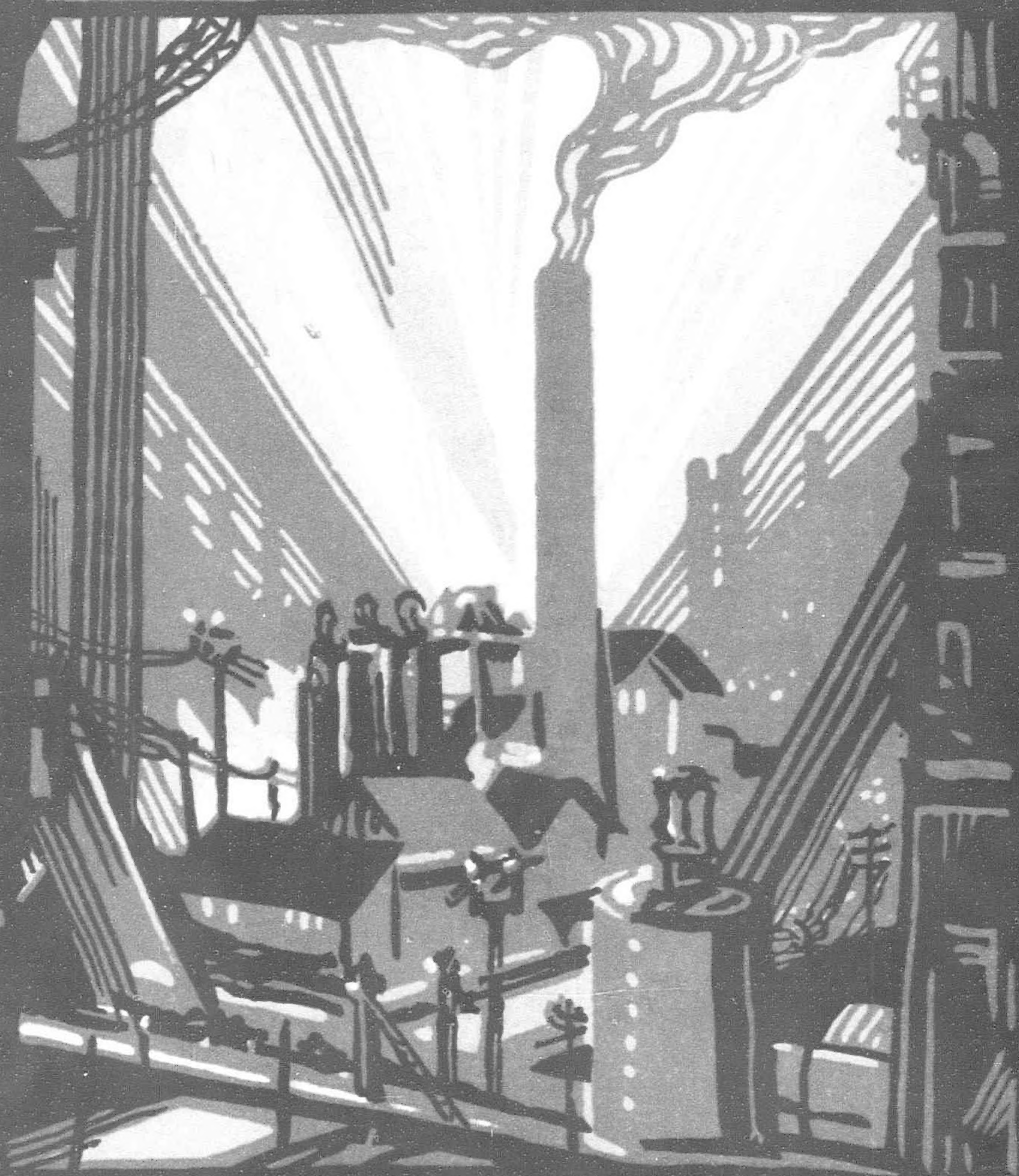
FINANCE

COMMERCE

ENGINEERING

THE
FAR EASTERN
REVIEW

FOUNDED BY GEORGE BRONSON REA
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PORTENTS OF THE FUTURE IN CHINA
THE NINE-POWER TREATY AND THE
OPEN DOOR
THE NEW P. & O. LINER "CANTON"

Vol. XXXIV

NOVEMBER, 1938

No. 11

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The Far Eastern Review

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SHANGHAI, NOVEMBER, 1938

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FAR EASTERN CROSS-CURRENTS

THE pivot on which Far Eastern affairs inevitably must swing in coming months is the Nine-Power Treaty that was signed at Washington fifteen years ago. The manner in which questions will be answered that have been raised in connection with this Treaty may give a new definition to the Open Door policy in China. It is contended by Great Britain and the United States that the terms of the Nine-Power Treaty must be interpreted in accordance with conditions in China that existed fifteen years ago when the Treaty was signed, and in consequence the Open Door Policy must be honored and followed in accordance with the original terms of this pronouncement made about thirty-eight years ago by the American Secretary of State, John Hay. Japan in occupation of China's whole sea coast and holding all of the leading cities and railways, as well as other routes of communications, has raised the contention that changed conditions in China necessitate revision of the Nine-Power Treaty, and Japan insists also that a new view must be taken of the Open Door Policy in China to conform with these changed conditions.

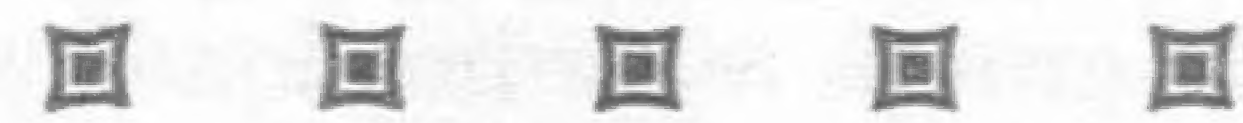
Japan, denying the charge that she has violated either the Nine-Power Treaty or the Kellogg-Briand Peace Pact, bases this denial on the right of self-defence, which in international legal practice, is inherent in every and in all treaties. This right of self-defence is set forth specifically in connection with the Kellogg-Briand Pact. In short, the Japanese contention is that, following the signing of the Nine-Power Treaty, China failed to make use of the opportunity that was given to her to attain the status of a world power, as was envisaged by the Powers that signed the Nine-Power Treaty. In this failure she permitted conditions to come to such a point that the actual existence of the Japanese Empire became menaced, and thus compelled Japan to take action.

Japan, in presenting her case at this time, reverts to the Ishii-Lansing Notes, in which the United States recognized that Japan possesses "special rights" in China and particularly in those parts of China in close proximity with Japan. Japan complains that recognition of these special rights in China is not given to her in the Nine-Power Treaty, and points out that Russia, re-armed and confronting her as a greater menace than ever in the past, did not sign the Nine-Power Treaty, and through the years has not been bound by it. Japan contends also that Germany, excluded when the original Treaty was signed, properly should have a voice in such a Treaty to-day.

The major occidental commercial interest that is affected by the present day situation are the vast British holdings in China. These, in magnitude, rival those of Japan. The commercial holdings of Great Britain and of Japan in China completely overshadow those of the United States by ratio of 11 to 1. This circumstance furnishes some basis for a recent outburst of America's greatest sensational journalist, William Randolph Hearst, who in a recently published editorial utterance, warned his countrymen against any new involvement in Far Eastern controversies that would thrust the United States into the position "of pulling British chestnuts out of the fire." Assuredly, it will be the purpose of the British Government to conserve and safeguard the great British stake in China, and it is more than half likely that Mr. Neville Chamberlain had something of this sort in mind in making his historic reply recently to Mr. C. A. Attlee, Leader of the Opposition, in the House of Commons. "There can be no development in China without a great deal of capital," said the British Prime Min-

ister on this occasion, "and for that Japan will have to go to other countries including Great Britain. So much capital is now being destroyed in China that even more will be wanted when the war is over, and it is quite certain that whoever reconstructs China cannot do it without some help from Great Britain." This is the statement that caused such a swift reaction in British commercial circles in the Far East, leading to the sending of an urgent cable from Shanghai to the British Foreign Office expressing disappointment over what the Prime Minister said.

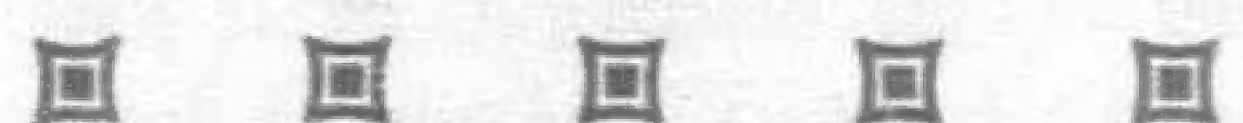
In connection with the Japanese intention to seek a revision of the Nine-Power Treaty an Italian viewpoint was expressed in a recent issue of the Italian newspaper *Messaggero* which said editorially: "It is evident that the new situation in China will demand the adoption of a different basis between the signatory Powers. Japan ought to enjoy a special position in Asia in view of her new responsibilities, which have been assumed at the cost of huge sacrifices."



Significantly and politely Japan gave her final *Sayonara* to the League of Nations early in November. The note conveying the decision of the Tokyo Government was forwarded on November 2 by the Japanese Minister to Switzerland, Mr. E. Amau, to the Secretary-General of the League, Mr. Joseph Avenol. The Spokesman of the Japanese Foreign Office cited five reasons for the action that was taken, as follows:

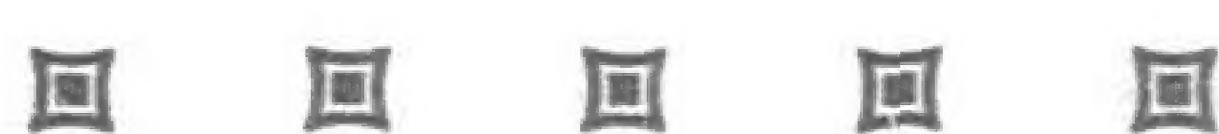
- First: The charge levelled by the League at Japan of violation of the Nine-Power Treaty, and the Briand-Kellogg Treaty in connection with the hostilities in China.
- Second: The moral support for China that the League of Nations has accorded.
- Third: The recommendation made by the League to individual member States to give assistance to China.
- Fourth: Condemnation by the League of the Japanese Air Force for alleged bombing of open towns.
- Fifth: Accusation drawn by the League of the use of poison gas by Japan and adoption by the Council of the League of the report recommending individual sanction against Japan.

In connection with the notification that was sent to Mr. Avenol, the Tokyo Foreign Office Spokesman added that Japan would continue to co-operate in international undertakings of a peaceful and humanitarian nature in accordance with the Imperial Rescript issued in March, 1933, when Japan withdrew from the League.



The two major Japanese commercial entities that have set about the huge task of reconstruction in China were brought into operation in Tokyo early in November. These are the North China Development Co., which is capitalized at Y.350,000,000.00, Marquis Sonyu Otani is the President. The other enterprise is the Central China Development Co., of which Mr. Kenji Kodama, veteran financier, is President. The China Development Co., affiliated with the South Manchuria Railway Co., which has been carrying forward development work in North China, is being

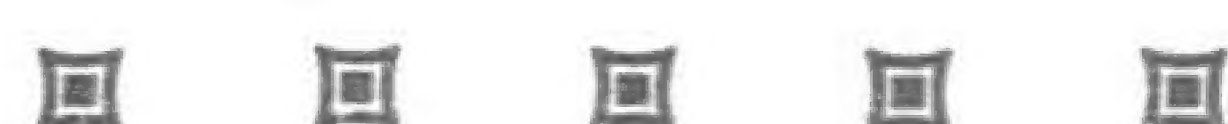
absorbed into the North China Development. Both of the two major enterprises are holding companies, and affiliated with the Central China Development Co., will be the Central China Iron Mining Co., The Central China Water and Electricity Co., The Shanghai Inland Navigation Company, The Central China Telecommunication Company, The Shanghai Real Estate Company, The Central China Interurban Motorbus Company and The Central China Fishery Company.



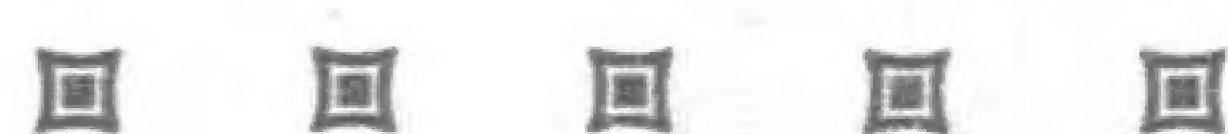
Questions pertaining to the exportation of iron ore from the Philippines to Japan have been the subject of recent conferences in Tokyo attended by Mr. E. Foster Bain, outstanding American authority, who is Adviser on Mines to the President of the Philippine Commonwealth, and Mr. Quinis Abadilla, Director of Mines in the Philippines. These conferences were made the subject of a news report published in the *Japan Advertiser*. On the outcome of the negotiations may depend the opening in the Philippines of a vast undeveloped government-controlled mine area having an annual capacity of a million tons and a reserve of between five hundred million and a billion tons, according to government survey. It is contemplated that a large production of iron ore in the Philippines will complement the coal produced in Manchuria and in North China.



News reports from the United States indicate that "no definite results" have yet been attained by the Chinese Financial Mission, headed by Mr. K. P. Chen, who, through recent weeks, has been holding conferences with the officials of the United States Treasury Department and with the leading American financiers. Negotiations at Washington to obtain credits for China were interrupted for a period in November to enable the Chinese visitors to go to New York where, it is understood, they conferred with important banking and industrial groups regarding loans, credits and purchases of supplies in the United States. Among other leading American personages with whom members of the Chinese Mission had meetings was Mr. Warren Lee Pierson, President of the Export-Import Bank.

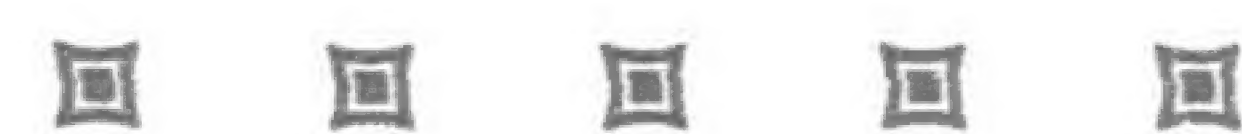


Evidences that the Tokyo Government is not so gravely affected by the costs of extensive warfare as to be unmindful of future needs of the Capital is seen in the beginning of work in November on an immense reservoir project that is to take seven years and cost Y.60,000,000.00. Actual work on this project began on November 12 at Okutama in the suburbs of Tokyo in the presence of the Home Minister, Admiral Nobumasa Suetsugu and Mayor Ichita Kobashi. A notable feature of this great project is that three populous villages will be obliterated from the map and submerged in an area to be transformed into a lake forty kilometers in circumference and capable of storing 18,400,000 cubic meters of water. It is estimated that the volume of water to be stored will be sufficient to supply the needs of 60,000,000 people in the Tokyo environs for 200 days through a maximum consumption period in the summer months. Arrangements are rapidly being carried out for the removal of the inhabitants of the three doomed villages. They are being transplanted and are to go either to Hokkaido or to Manchoukuo. Before the people of the villages were taken from their homes moving pictures of their life as it had been lived in the villages was filmed by students of the Art Department of Nippon University in Tokyo.



Keen interest in the expanding economic strength of Manchoukuo was expressed by Dr. Wilhelm Wagner, first Reich Minister to the Court of Emperor Kang Teh, at Hsinking, in a statement that the German Diplomat issued following the presentation of his credentials on November 12. "Chancellor Hitler," said the German Diplomat, "stressed that the opening of the German Legation at Hsinking is an appropriate expression of the amicable relationship between Germany and Manchoukuo." Doctor Wagner expressed the hope that "perpetual happy results" would be brought about through the exchange of diplomats between Manchoukuo and the Reich, as provided for in the Treaty entered into

on May 12 last. "This friendship of ours," he added, "will be best shown when we shall have established a developing commercial relationship in the future. This German-Manchoukuo relationship becomes ideally parallel to the existing friendship between Japan and the Reich, enhancing the happiness of the peoples of these three countries, at the same time serving as a decided factor in the maintenance of world peace."



Officials of the newly-organized American President Line of Steamers, formerly the Dollar Co., seem to be unable to say when American steamers of this Line again will make Shanghai a port of call. The first President Liner to come to Shanghai since the service of steamers of the Line was suspended in the summer of 1937 when hostilities opened was the *President Coolidge* which docked in Shanghai on October 23. Ill-fortune followed the vessel on this first voyage reopening service in the Far Eastern waters. At Shanghai the ship was unable to accept a shipment of treasure, gold and silver, valued at U.S. \$4,500,000.00, and after sailing from Shanghai without this valuable cargo she encountered a lesser mishap at Kobe when the craft struck the fourth wharf on her arrival at Kobe on October 27. The damage done in this mishap was slight and the vessel sailed the same day. Steamers of the President Line en route from the States visit Kobe and proceed thence to Hongkong without calling at Shanghai. The incident in connection with the attempted treasure shipment at Shanghai has been made the subject of diplomatic exchanges. Shipment of gold and silver from China some time ago was prohibited in an edict issued by the newly-organized Reformed Government. Officials of the Chase Bank in Shanghai, custodian of the treasure in question, were under the impression that they had obtained all required permits to forward the gold and silver to the United States. It was after the actual transfer of the treasure from the Bank's vaults to the *President Coolidge* under the guard of an escort of the United States Marines, that officials of the Reformed Government revoked all permits to make the shipment. The vessel was delayed 24 hours while the gold and silver was being removed and taken back to the Bank's vaults, in which it remains. In an indirect manner this affair was unfortunate also for the Government of Chiang Kai-shek for news reports of the incident of Shanghai that were published in American newspapers at that time caused Chinese in the United States to halt remittances they were then making to China.



Radio-Telephone communication between Shanghai and Tokyo was resumed on October 20, after having been suspended through fourteen months owing to warfare in China. Reports from Tokyo state that initial operations of the service were not very successful owing to atmospheric conditions and to hasty installation of equipment. Work being done at the Chengju Radio Station which will be completed by the end of the year, it is believed, will restore clarity to the transmission of messages between the Port of Shanghai and Japan.



Mr. Hachiro Arita, former Japanese Ambassador to China, was appointed Foreign Minister, and Mr. Yoshiaki Hata, former Vice-President of the South Manchuria Railway Company, was appointed Minister of Overseas Affairs, in the presence of the Emperor at Tokyo on October 30. In an editorial on October 31, the *Shanghai Times* made the comment that the difficult task Mr. Arita faces would be to deal with complaints that the Open Door is not being respected, and to readjust impaired Anglo-Japanese relations in order to effect collaboration of the two countries which is essential to peace and prosperity in the Far East.

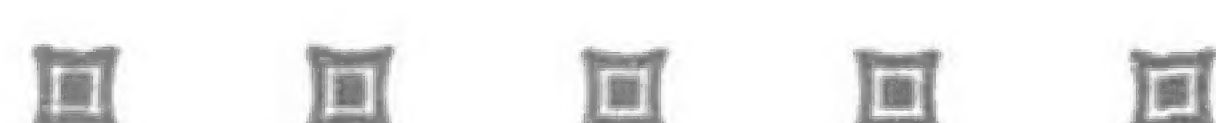


China's ancient five-barred emblem, now the flag of the Reformed Government of China, was unfurled over the Customs House in Shanghai on November 4. The flag was not raised again the next day, but was hoisted again on Sunday. It was explained that the flag was first unfurled on November 4 to set an official precedent after which regular Customs regulations providing for

display of the flag on Sundays and holidays will be observed. The flag was not raised on November 12, birthday of the late Doctor Sun Yat-sen, indicating that the Reformed Government will not mark as a holiday the birthday of the father of the Chinese Revolution.



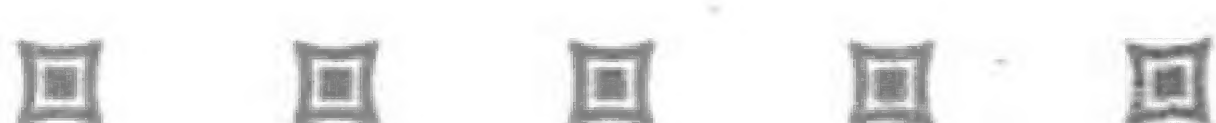
A new set of Tax Regulations applying to war-time excess profits was announced by the National Government of China on November 6. One special tax will be levied on profits of private firms capitalized at \$2,000.00 or more when profits exceed 15% of the capitalization. Another tax applying to lands will be levied on revenues above 12% of the assessed value of the property. These taxes will be on a sliding scale, and other taxes will be levied on trading profits amounting to 15%, when such profits amount to 20% and rise to 50% on trading profits of more than 60%. The position of foreign firms with regard to the new taxation is not defined. The right to appeal from decision is permitted, but heavy penalty are provided for attempted evasion of tax.



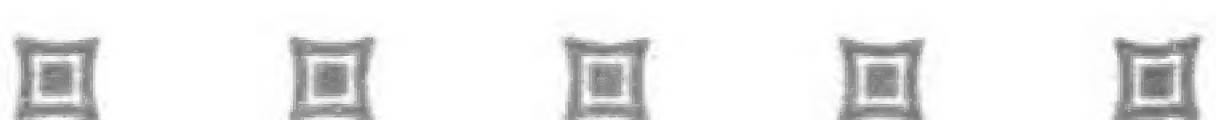
According to news reports in copies of the *Shun Pao*, arriving in Shanghai from Chungking on November 7, construction of new railways connecting Yunnan with Szechuen Provinces, and Kunming and Burma, is being started this month. According to estimates given these railways will not be completed for three years. The reports indicate that the Yunnan-Burma Railway is being constructed jointly by the National Government and British interests. The Yunnan-Szechuen Railway is to be constructed by Chinese interests alone, and will connect Kunming, Chuchin, Shuanwei, Weining and Shuchen. The viewpoint of French interests in connection with these projected railways should be a matter of interest by reason of the vested French interests in Yunnan Province.



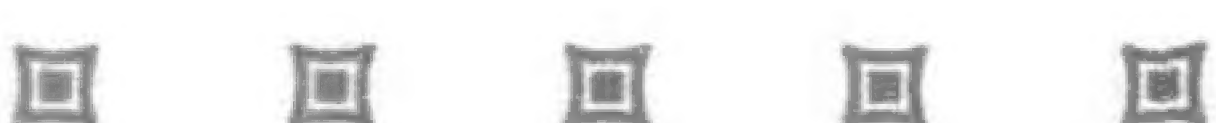
On the eve of the anniversary of the birth of Emperor Meiji, the Japanese Government issued a statement regarding his future policy towards China. In this connection it was asserted that a new order in Asia consisting of a tripartite relationship of mutual aid and co-ordination between Japan, Manchoukuo and China is the ultimate aim of the present military campaign. The contention is advanced that the Kuomintang Government no longer exists except as a merely local regime, but that as long as it maintains its anti-Japanese and pro-Communist policy, Japan will not lay down arms. It is asserted, however, that Japan will not reject the participation of the Kuomintang Government in the establishment of a new order in the Far East if the Kuomintang repudiates its anti-Japanese and pro-Communist attitude, and remolds its personnel.



Creation of the Asia Development Board was endorsed by the Japanese Cabinet on November 18. This institution, after it has received approval of the Privy Council, will have charge of the work of shaping long-term rehabilitation and reconstruction in China by mobilizing and co-ordinating national resources. It will be the task of this Board to bring the Chinese people to realize that their co-operation with Japan to effect everlasting peace to Asia is indispensable.



Financial circles seem to attach some significance to the recent visit to Hsinking of Mr. Hall-Patch, Financial Adviser to the British Embassy in China. Mr. Hall-Patch went to Manchoukuo after a stay in Tokyo and on his journey to Hsinking on October 24 he was accompanied by Mr. White, British Consul-General at Mukden. It is understood that in conferences with financial leaders in Manchoukuo, discussions were directed to questions pertaining to industrial and economic conditions in Manchoukuo. After the visit to Hsinking Mr. Hall-Patch returned to Japan and sailed thence for England by way of America.



In the course of the Japanese thrust up the Yangtze an important incident took place on October 20, when the invaders

occupied the territory of the Tayeh Mines. Although little was known of this valuable iron ore reserve until 1870, it is believed that these mines have been worked for centuries in a primitive manner, traces being found of mining operations in the Tang and Sung Dynasties.

The Tayeh iron fields of China have been so closely associated with Japan and the Yawata iron mills (now Nippon Seitetsu Ltd.) that a mere mention of Tayeh reminds one of iron ores and Japan's steel industry. The Tayeh iron fields occupy an area of approximately 220 square miles, stretching west of Shihhueiyao on the Yangtze, just about 71 miles below Hankow, which the Japanese naval landing corps occupied on October 16.

Included in the iron fields are Tiehshanpu, Shihtzushan, Siangpishan, Chienerhshan, Chienshanchiao, Yukiashan, and Tayehmiao. The district is under the jurisdiction of Tayehhsien and abounds in lakes and marshes. The iron ores are found among limestone and diorite formations, rising from 300 to 400 meters among swamps.

Iron veins are found mostly where the limestone and diorite come in contact, and approximately 100-million tons of iron are estimated to be deposited in the Tayeh district. In the Shihtzushan iron field in particular, iron veins are exposed more than 200 meters above the ground, and experts believe that the veins extend 400 meters underground. There also are found coal, copper, and lime of commercial value in this district.

Chang Chih-tung, civil governor of Hupei and Hunan provinces during the declining years of the Ching dynasty, recalling a passage out of an old document, decided that the district must abound in iron that could be made into steel for cutlery, and proposed to the Peking government that the region be systematically explored.

In 1890 the Peking government enlisted the service of a European mining engineer, who while tapping the strata along the southern bank of the Yangtze river, discovered traces of ancient iron smelting near the Yangtze bank. Advancing into the interior, this mining engineer struck it rich in the district now known as the Tayeh iron fields.

This engineer, astounded by the enormous asset he had discovered, cabled his own government informing of his find, without telling the Peking government. His own government at once began negotiating with the Peking government for the leasehold of Tayeh and substantial concessions. During the progress of the negotiations the treachery of the mining engineer was bared, and the negotiations fell through.

The Peking government hurriedly established iron mills at Hanyang, with a view to smelting the iron ores to be mined at Tayeh. Simultaneously the Ching government established modern mining facilities at Tayeh, and for mining coal from Pinghsiang coal field.

The Peking government, hard pressed for funds needed to indemnify Japan as the result of the Sino-Japanese war, sold the Tayeh iron fields to Cheng Suan-huai, one of the statesmen and financiers of the late Ching dynasty. Cheng Suan-huai, by subscribing funds from the public, established the Hanyehping Iron Mining Corp. in 1908. This concern still operates the Tayeh iron fields.

Japan's relations with the Tayeh iron fields began in 1899, when the late Prince Hirobumi Ito reached an agreement with Empress Dowager Sitaihu, the last actual ruler of the Ching dynasty, whereby China was to supply annually 50,000 tons of iron from Tayeh for five years to the Yawata iron mills, now operated by the Nippon Seitetsu Ltd.

In 1904 the contract was renewed and the validity was extended for 15 years. In 1913 the contract was revised to be good for 40 years, during which time it was agreed that China should furnish 17 million tons of iron ores and 8,000,000 tons of pig iron.

It was further agreed that the Hanyehping Corp. was to obtain the service of an engineer and advisory accountant from Japan to supervise the operation of the Tayeh iron fields, and that China should not furnish iron to any third power without Japan's consent while the contract was in force.

The Hanyehping Corp. obtained considerable loans from the Yokohama Specie Bank, the Japan Industrial Bank, the Mitsui and Okura interests on more than 10 occasions in the past ever since the firm was established. In order to liquidate the loans and to protect the lien on the loans, Japan time and again proposed that the concern be converted into a Sino-Japanese joint undertaking, but the Chinese invariably turned down the proposal on

one pretext or other. The loans advanced by Japan to Hanyehping Corp. are estimated to reach some Y.70-million, including interest.

In 1893 the 19-mile Tayeh railway was built from Shihhueiyao to the Tayeh iron mountain, for conveying ores from the mine to the Yangtze bank. In addition two short branch lines to the Shihtzeshan iron mine.

The Tayeh ores contain from 65 to 70 per cent of iron, which are better than the best the United States, British, and German ores have to show. The best in America assay at 50 per cent, the best in Britain and Germany hardly surpass 40 per cent.

Of late Tayeh fields have been yielding 3,000,000 to 4,000,000 tons annually. Since Japan cannot have too much iron, the rich iron ores of Tayeh will come in handy, now that the Japanese forces have assumed complete command of the iron fields.



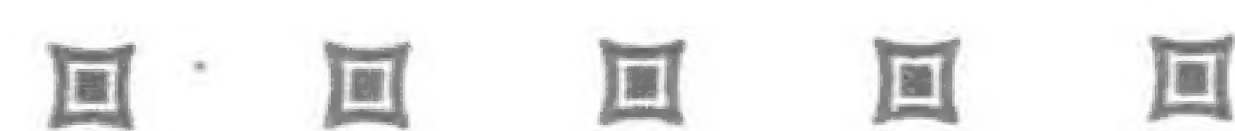
Diplomatic representatives of Third Powers were notified on November 7 by Mr. Hachiro Arita, Japanese Foreign Minister, that the zones of hostilities in China will be enlarged in the future and that adequate measures should be taken on the part of third powers to safeguard the lives and property of their nationals in those areas.



The third regular meeting of the Second Session of the National People's Political Assembly was held at Chungking on October 30. The meeting was attended by 132 members and presided over by Mr. Wan Ching-wei, President of the Assembly. A detailed report on financial affairs was submitted by Dr. H. H. Kung, president of the Executive Yuan and concurrently Minister of Finance.

After reporting on the control of foreign exchange and the stability of the national currency since the outbreak of the Sino-Japanese hostilities, Dr. Kung expressed deep appreciation of the patriotism of the people, including the overseas Chinese, in subscribing to the Liberty Bonds.

The meeting later adopted a unanimous resolution to support Generalissimo Chiang Kai-shek in spite of the loss of Wuhan and Canton.



In response to the visit paid by the Kamikaze, a Japanese-made speed plane which flew from Tokyo to London in record time last year, the Santo Francesco, a long-distance speed plane of the *Stampa*, an Italian newspaper, started from Rome at 0.18 a.m. November 9 for Tokyo. The plane was expected to arrive at Tokyo in 55 hours, but made a forced landing in the neighborhood of Bayreuth, Syria, according to a report which reached Paris at 8.30 a.m. on the same day. A later report stated that the plane encountered a severe hailstorm and an aileron was damaged. It was later said that the Italian aviators will try the flight again.



According to a statement issued by the Reformed Government on November 11, a Farmers' Bank will be established in the near future so that the economic foundation of a new China may be built upon a solid basis. The creation of such an institution was urged in a set of proposals presented to the Joint Commission of the Provisional and Reformed Government by a delegation of about 100 Chinese from Kiangsu, Chekiang, and Anhwei when the Commission met in Nanking early in November.

Portents of the Future in China

A Japanese Viewpoint

THE Sino-Japanese hostilities have entered the fourth phase. The feature of the new phase is that while *de facto* war may continue there will be launched constructive measures such as the consolidation of the occupied districts by mopping-up the remnants of the defeated enemy troops, establishment of administrative organs in order to keep peace and order, reconstruction of devastated areas, supply of food and lodging to homeless refugees and similar activities.

Whether the Japanese forces will further push the frontal line of war operations into the hinterland or be satisfied with consolidating the occupied regions is not divulged so far. General Chiang Kai-shek and others seem to opine that when the Japanese forces thrust farther into the vast hinterland they will meet with the same fate Napoleon met at Moscow. But even if the Japanese forces should choose the former course it would not follow that they would experience a crushing defeat, for one must take into consideration the change of the times; that is, the progress of the art of fighting through development of science between the period of Napoleonic wars, and the present day. Transportation facilities have so much improved that it is quite idle to compare those in the 19th century and those in the latest period. Recent air raids have proved that even the remotest spots of China cannot escape bombing attacks of Japanese aeroplanes. It may therefore be assumed that if the Japanese forces refrain from further marching into the hinterland, it is because such an adventure is not worth while, and not because they are afraid of being enticed into utter annihilation by the Chinese forces.

All the coastal regions are blockaded by the Japanese Navy, and the two greatest railway lines traversing China perpendicularly have fallen into Japan's hands. The greater portion of the Yangtze River, a 3,000 mile long artery running midway across the continent, is available for Japanese shipping. If Japan succeeds in consolidating and developing these vast regions the Chiang Kai-

shek regime will lose the character of a central government, and their resisting strength will gradually evaporate. In such a case, it is no longer necessary to drive the Kuomintang troops to the wall; it will perhaps be the Japanese course to await the destruction which must be their unavoidable fate if no third power intervenes. Under the circumstances, the best advisable plan to be adopted by the Japanese will be to entrench themselves along the railway lines traversing the continent from North and South. This defensive line will be invulnerable like a Maginot line and any frontal attack on the part of the Chinese could be repulsed with tremendous losses.

Constructive Plans Launched

In the meantime constructive plans in the occupied areas will be pushed forward by the new Chinese regime. There is no fear of their being molested by guerillas, for when the Japanese forces assume a defensive position, the greater portion of the troops can be spared for mopping-up operations. Thus it may be said that the Sino-Japanese incident has come into its final stage, which requires the most elaborate administrative tact on the part of the Japanese authorities. Many difficult international problems remain unsolved, and they must be dealt with by the Japanese Government in co-operation with the new Chinese regime.

The problems including the navigation of the Yangtze River, the opening of the districts north of the Soochow Creek in Shanghai, trade monopolies, and the like have very close relations with the principle of the "open-door" and equal opportunity which are so zealously asserted by the United States and supported by Great Britain and France.

The question of Yangtze navigation will not be a hard nut to crack, for Japan is far from desiring to monopolize the navigation of the river, and its opening is only a question of time. The

objectors to the so-called blockade of the river by Japan must be convinced of the fact that the river is still used for the supply of munitions, food and the like which are required for war operations.

The opening of the Hongkew and Yangtszepoo areas in Shanghai is also not a difficult problem. Had the French Concession and the International Settlement been cleared of the hotbed of the terrorists, the districts north of the creek would have been opened by this time. Now that the new City Government has been removed to the new Civic Center, and the Reformed Government organs to Nanking, there seems to be no further cause for keeping the Northern districts closed. But still some cases of terrorism are reported from time to time. The most essential thing for the Shanghai Municipal Council to do will be to exterminate disturbing elements; otherwise the Japanese in the Northern districts will be exposed to extreme dangers after the restrictions are taken away.

Open-door Policy and National Interest

The trade monopoly question must be solved in connection with the open-door principle. Japan will not monopolize all branches of trade and industry; it will be a matter of course that she will respect the "open-door" as a principle, but differences of opinion will probably develop between Japan and the United States as regards the interpretation of the "open-door."

If the United States and Great Britain are adamant in their adherence to their own interpretation of the "open-door," complications must arise between the democratic countries and Japan, for while Japan is far from seeking to monopolize trade opportunities in China, she will demand recognition of her special position which she claims to have obtained through enormous sacrifices of men and money.

It is argued by Americans that if any international treaty is violated by one power without the consent of all other powers which signed it the sanctity of treaties cannot be observed. Violation of a treaty, however, often occurs when the very treaty outlives changes of circumstances which make its application bring injustice to one particular power unless it is revised. Japanese public opinion cites the Nine Power Treaty as an example for supporting this argument.

All the powers which are interested in Chinese affairs have formulated their own national policies towards China which may not be identical, but the fundamental principle underlying each of their Chinese policies must be based on national interest. No power, even the United States may cloak its foreign policy with hypocritical remarks that its fundamental purpose is quite altruistic; its aims at the preservation of China is simply for its own interests. The principle of open door and equal opportunity betrays such altruistic pronouncements.

Alfred T. Mahan once remarked that national interest is the primary consideration for national policy and that self-interest is not only a legitimate, but a fundamental cause for national policy.

It is an undeniable fact that the principle of "open-door" and equal opportunity best serves the purpose of national interests of the Anglo-Saxon powers. That's why the principle forms the basis of the Nine Power Treaty.

Now, if the same principle of national interest is applied to Japan the Nine Power Treaty is not only very inconvenient but quite unjustifiable to her since it utterly disregards any special interests accrued from geographical propinquity. It disregards the fact that Japan has paid gigantic sacrifices in China simply because the latter is in geographical propinquity with Japan.

Under such circumstances, Japan has worked out a new Chinese policy which may serve the double purpose of preserving the integrity of China and of safeguarding the national interest of Japan. General Chiang Kai-shek's regime rejected this policy of Japan, and the democratic powers also denounced it as incompatible with the spirit of the Nine Power Treaty.

Thus it will be seen that the democratic powers and Japan oppose one another in Chinese policy. The former would adhere to the Nine Power Treaty as it will best serve their own national interests by sustaining the Chiang Kai-shek government, while the latter will demand revision of the treaty which no longer meets the demands of the time as far as Japan is concerned. Adherence to the treaty means for Japan the negation of her special position, her rights and interests, nay, not only must

she surrender her "special" rights and interests, but even her common rights and interests in China. The Chiang Kai-shek regime, which the protagonists of the Nine Power Treaty support, owes its existence to and has as its basic policy the purpose to destroy Japan.

Via Media Between the Two Views

Then the whole question centers on whether or not the Chiang Kai-shek regime is supported by the whole Chinese nation. While General Chiang Kai-shek asserts that he enjoys the confidence of the nation, Japan regards his regime as of a mere regional importance, no longer supported by the whole nation.

The United States government may aver that even supposing that General Chiang's Government has degenerated into a mere local entity, that does not justify the existence of new Chinese regimes at Nanking or Peking, for the foreign policy of the United States refuses to recognize any new status produced as the result of force. If the United States sticks to this policy there appears to be no possibility of reconciling American views with those of Japan. The best solution would seem to lie in a *via media* between the two extreme viewpoints. As long as third powers entertain the belief that Japan was responsible for enlarging hostilities there will be no immediate prospect of finding such a *via media*. It would appear that it was far from Japan's intention to extend hostilities to Shanghai; otherwise Japan might not have attempted to defend the lives and interests of the Japanese subjects in Shanghai with such an insignificant force of naval landing troops. Just think of the situation facing the naval landing units pending the arrival of the army forces. But for almost superhuman efforts of brave naval marine forces to stem the tide of overwhelmingly superior Chinese forces until reinforcements arrived, all the Japanese civilians might have been slaughtered as has happened before, in Hankow, Nanking and Tientsin, in bygone days.

Indeed it might be said that Shanghai's hostilities are a *prima facie* case of self-defence for Japan. Now that Sino-Japanese hostilities have developed to the present dimensions, Japan has no alternative but to push the conflict to finality, which seems near at hand. Thus the aim is to effect a state of affairs in China insuring non-repetition of hostilities.

From Japan's point of view it may be said that the Shanghai hostilities were responsible for the enlargement of the war operations to present-day dimensions, for from a strategic standpoint the military investment of Hankow and Canton may be said to be a continuation of Shanghai hostilities just as the conquering of Nanking was.

After the fall of Canton and Hankow, the objective of the Japanese army is Changsha which will have been occupied by the Japanese by the time this is published. Meanwhile Japanese reports from reliable sources seem to confirm that Chiang's strength is gradually diminishing, thus confirming Japan's assertion that after the fall of Canton and Wuhan Chiang's government can be of local importance only.

Should Chiang's resistance give way, the logical conclusion is that *de facto* peace will be actually restored. What neutral observers are most interested is that even at that time the democratic powers will still regard the Kuomintang Regime as a *de jure* government and refuse to deal with the new China government. In such a case there will be no workable basis for the solution of pending problems between Japan and the third powers. It will be incumbent on the third powers, especially Great Britain and the United States to face this changed situation from a new angle so that methods may be found to solve the grave problems involving the rights and interests of the third powers in China.

Foreign Capital Welcomed

When the Sino-Japanese incident enters fully on the fourth, that is on the constructive stage, it naturally follows that Japan will require a tremendous amount of capital for investment in the occupied regions. Japan will be only too glad to welcome investment of third party nationals and to give them assurance that their rights and interests will be respected and safeguarded.

Recently Mr. Kenji Kodama, President of the newly-formed Central China Development Company, is quoted as having declared

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Revision of the Nine Power Treaty and the "Open Door"

By TSURUMATSU OKAMOTO, Assistant Editor, *The Tokyo Asahi*

It is repeatedly suggested that Japan is about to propose the revision of the Nine-Power Pact. This is a very sensible suggestion since the pact is now a dead letter and is no longer applicable to the real conditions in China. It may be recalled that in August, 1917, Japan sent the Ishii Mission to Washington in order to smooth strained relations between Japan and the United States which had been caused concerning the interpretation of the "open door" policy with the consequence that the United States gave recognition of Japan's special interests in China.

The Ishii-Lansing Notes stated that the Governments of the United States and Japan recognize that territorial propinquity creates special relations between countries, and consequently the Government of the United States recognized that Japan has special interests in China, particularly in the part to which her possessions are contiguous.

Of course the two Governments meant by these Notes to adhere to the principle of the "open door" and equal opportunity for commerce and industry in China. With the signing of the Nine-Power Treaty of Washington, however, the Notes were cancelled on April 14, 1923. From the side of Japan this replacement of the Ishii-Lansing Notes by the Nine-Power Treaty was a reverse of her position in China, for her special rights in China were not recognized in the Treaty.

It is easy to explain how Washington succeeded in forcing Japan to sign the Treaty. It was when the World War was at its height, and the Allied cause assumed the gloomiest aspect that Japan dispatched Viscount Ishii to Washington to gloze over matters regarding the disputes over the interpretation of the "open door," and Japan succeeded in inducing Washington to recognize Japan's special interests in China.

The Nine Power Treaty, on the other hand, was thrust upon Japan when peace was restored in Europe, and Washington took a common front with Great Britain in isolating Japan through the abrogation of the Anglo-Japanese Alliance. The signing of the Nine-Power Treaty meant a great diplomatic triumph of the Anglo-Saxon nations, for the "open door" policy, which the Treaty stressed, practically amounted to giving the two nations monopoly or at least the lion's share of the trade in China. It implied nothing else but "spheres of interest" for the two greatest commercial nations.

It will be seen that different international situations, more especially European situations, accounted for the production of different treaties relating to China involving Japan and the United States. When the Nine Power Treaty was signed the U.S. and Great Britain had no longer any concern over Europe, since Germany had been driven out of the international arena of politics. In short, Japan yielded to the force of circumstances, but her discontent remained dormant ready to be actively expressed at the first opportunity. One of Japan's objections was that whereas the Ishii-Lansing Notes recognized her special interests, and more especially those created by territorial contiguity, the Nine-Power Treaty disregarded any geographical considerations which should have occupied an important position in any treaty to be applied to the Asiatic continent just as the "open door" policy of the U.S. would find an exception in her Caribbean European policy. It was quite natural that in less than a decade conditions revealed the Nine Power Treaty to be an instrument impotent to preserve peace in the Far East.

The Kuomintang Government elated at the success of her diplomacy in the form of the Nine Power Treaty, and too eager for her rights-recovery movement, attempted even to encroach on Japanese interests in Manchuria, hence the Manchurian incident.

The Manchurian incident of 1931 and the Sino-Japanese hostilities of 1937, revealed that the Nine Power Treaty could

hardly ensure the peace of the Far East. The reason is that the treaty was based on a misconception of the democratic powers that the Kuomintang government alone was qualified to unite China. At that time the Kuomintang itself was split by quarrels of conflicting elements within itself.

Thus the Nine Power Treaty cannot assure the permanent peace of the Far East and the treaty therefore should be subjected to scrutiny and revised to conform to the needs of the time. As Germany was excluded when the original treaty was made this wrong should be rectified in a new treaty.

When Lord Charles Beresford visited Shanghai in 1901, he remarked that the "open door" was of no use unless the room inside is in order. It cannot be said that the Kuomintang Government put the room in order so that the door might be opened to entertain guests. It may be asserted that the Chiang Kai-shek government had nearly succeeded in effecting unification of China, when Japan interfered, but it must be remembered that the unification of China under Chiang Kai-shek was being effected at the expense of Japan. In short Chiang Kai-shek succeeded in using the Japanese bogey as the instrument for uniting the nation, with the ultimate object of driving Japanese rights and interests out of China.

The Nine Power Treaty failed to satisfy Japan, because instead of recognizing special interests in China, which should be accorded her on account of her geographical propinquity, it accords equal treatment to all powers concerned, Oriental and Occidental, irrespective of geographical conditions, and this equal treatment, be it remembered, simply meant favorable treatment for the Anglo-Saxon powers.

As long as China's international situation remained just as it was when the Nine Power Treaty was signed, Japan might have been expected to adhere to it, but to-day the situation has completely altered. Germany which was left out in the cold when the Nine Power Treaty was drafted has been resuscitated to such an extent as to be able to assert her part in international affairs. Japan is not asking too much in seeking a new interpretation to the "open door" of China by fundamentally revising the Nine Power Treaty.

Japan will be quite willing to observe the "open door" policy, not in the sense the U.S.A. would interpret, but in a new sense of the term more in conformity with the existing situation. Even in the Ishii-Lansing Notes Japan's special rights were recognized. Now that enormous sacrifice has been made by Japan, thanks to the anti-Japanese campaign of the Kuomintang Government, Japan's position in China may be said to have undergone a complete change. Japan claims her special position in China as the unique pacifying factor in the Far East. In short, Japan demands certain exceptions to the "open door" policy just as the United States enjoyed exceptions to her professed "open door" policy in Philippines and Hawaii. In May, 1873, the U.S. contracted a treaty of reciprocity with the Hawaiian Islands in which the U.S.A. enjoyed special rights not to be claimed by other nations under the most-favored nation clause. Again, in 1898, the U.S. agreed to give Spain equality of treatment in Philippines ports for ten years, but she erected the tariff in November, 1901, and thus offended against the spirit of the "open door" declarations. These actions on the part of the United States were, however, quite reasonable in view of the paramount interests she possessed in these Islands even before they were annexed to her.

Of course, the conversion of China into a second Manchoukuo is not the real intention of Japan, since China proper and Manchoukuo cannot be regarded as being on the same plane owing to differences of historical as well as geographical conditions. What Japan would accept as the basis of harmonious collaboration with

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How the Bridge Over the Hwang River was Repaired

(The following official report concerning the repairs of the Bridge over the Hwang River was issued on September 25, 1938, by the Intelligence Department belonging to the Staff Quarters of the Japanese Army, Suematsu Division).

* * *

THE famous bridge, which is said to be the finest and strongest bridge in the Orient, was completed in October, 1912. The history of the construction of the Peking-Pukow Railway amply shows how the German engineers taxed their brains in the building of this bridge. As a matter of fact, the construction of the railway was simultaneously set about from both ends, that is, from Tientsin and Pukow. With Han-Chwang as the center, the construction work was divided into Northern and Southern sections. The former was undertaken by British engineers, and the latter by Germans. Indeed it assumed an aspect of scientific and engineering competition between Germans and Britons.

The Bridge over the Hwang which was constructed by German engineers bears testimony to the high prestige of German bridge-building engineering. It is told that for this bridge-building project German authorities ordered all the firms in Germany to present plans and by combining the excellent parts of the plans thus presented, succeeded in producing the best plan conceivable.

It was brought to perfection in three years at the cost of Y.6,000,000. The ablest engineers in Germany were mobilized for the construction work.

This bridge was completely destroyed by explosives last autumn by the Central Army troops of Chiang Kai-shek. Some engineers who witnessed the scene lamented that there was no immediate possibility of repairing the bridge. The Japanese Army forces, however, were determined to repair the bridge by surmounting any obstacle which might present itself.

Immediately after Tsinan was occupied, the repair work on the demolished bridge was commenced. The plan was made by Mr. G. Inaba, engineer of the Japanese Government Railways. All the leading engineers of the South Manchuria Railway Company assisted with the repair work, which was entrusted to the Hazama-Gumi, public-works Contractor, whose main office is at Aoyama, Tokyo.

It was on January 12 that the engineers and workers of the Hazama-Gumi first arrived at Tsinan. There was no Japanese resident in the town at that time.

Under the direction of Colonel Masuda, Superintendent of the Works, preparatory activities were started. Huts were constructed, and coolies were recruited. On February 4, all the necessary machinery and tools had arrived at the spot, and thus was commenced what was to be the greatest and most difficult work in the history of Japanese bridge building. It was the cold month of February. The rapid current of the river obstructed the work, but on February 11, that is, on the National Holiday Kigenetsu, a temporary bridge was opened. On the following day five enemy planes came over the spot and dropped bombs killing four Japanese (two soldiers, one Hazama-Gumi employee and one South Manchuria Railway employee), six Chinese coolies, injuring over ten Japanese, and fifty Chinese. Later three enemy planes bombed the bridge, but fortunately there were no casualties among the Japanese at this time. About fifty Chinese coolies were slightly hurt. The workers were also constantly menaced by guerilla attacks, but extreme precautions taken by the engineering corps of Sasaki's Division, and other units held the guerillas at bay, so that they could not approach and obstruct the repair work.

"Repairs" does not describe the real nature of the work itself, for the only spans which escaped bombing and were left standing were two at one end, and one on the other. The remaining nine spans were either destroyed or were hurled down to the dry river bed, or sunk into the water. One ordinary span is 91.5 meters in length, and weighs 530 tons. Japanese engineers had never dealt with such long and heavy spans before. Moreover, one center span and two anchor-spans which fell to the river bed weigh 3,100 tons in all.

But these spans had to be lifted at any cost. The best jacks from 75 tons to 100 tons of the Imperial Railways were brought; and other more powerful jacks were sought. Fortunately for jacks each of 300 tons were at the Broadcasting Station at Saitama Prefecture near Tokyo. These had been used in erecting iron towers. These jacks were brought and utilized for the lifting for the heavy spans.

The most difficult part of the work was the question of the "German" spans. Japanese engineers on the spot had had no experience in handling these "German" spans, for no bridge building work of this sort had ever been done in Japan. This "German" span is nothing but a double center span. The two most important piers at the ends of the bridge (the distance between them being 164.70 meters) had to be spanned. This spanning called for special skill, and it is called "German" span, simply because a German engineer invented the method.

The two spans each from one of the piers must slowly approach one another by means of load pressure on the piers, so that they meet in the center where no support is available and join together. They thus become one perfect span between the piers at both sides of the river bed. The meeting of the two "German" spans, that is, center spans, would fail should a difference of even a few millimeters occur. Since iron is liable to contract or expand from temperature it may be that a span measuring 82.35 meters would produce a difference of a few millimeters even by atmospheric temperature.

The engineers by anticipating the exact time at which the two spans would meet, tried to obtain the atmospheric temperature at the time in question by means of statistics and they succeeded in obtaining average figures of the iron's expansion at the time the spans came together. It took half a month for this scientific survey, and the exact lengths of the two spans had been obtained.

When the day came Mr. Inaba, Chief Engineer, who had never been on the spot arrived from Tokyo. All the engineers awaited the result with mingled feelings of expectation and uncertainty, for the completion of the strategically vital line depended on the successful meeting of the center spans. Not only that, but the prestige of Japanese bridge building engineering, nay, Japanese scientific skill was at stake. The eyes of all present were fixed upon the ends of the two gigantic iron spans. Suddenly there arose a deafening acclamation. The spans perfectly met! The eyes of Lieutenant-Colonel Masuda, Superintendent of the works, were full of tears, for the brilliant accomplishment of the great task was too much for him to restrain his emotions. It was a dramatic moment.

According to the first estimate the repair work was to have been completed on July 20, but the work progressed so smoothly that it was finished on July 1, that is, within four months. The total cost was Y1,500,000. The work itself was undertaken by the Hazama-Gumi under the direction of the Military and the South Manchuria Railway authorities. The Yokozawa Bridge-Building Co., did the rivetting work.

The total number of the employees were 25,000 Japanese and 63,000 Chinese. Daily wages were: Y6.00 per Japanese, Y4.00 per Korean, and Y0.70 per Chinese coolie, and Y2.00 per skilled Chinese worker. The Chinese coolies were assembled from the neighboring districts.

The iron used for the work was manufactured by the Yokozawa Bridge-Building Co. of Tokyo and the Railway Manufacturing Co., of Osaka.

Dependents of those killed by enemy planes' bombing attacks were provided for by the South Manchuria Railway Company. The families of Chinese victims have been granted allowances.

The opening ceremony of the bridge was held by the Military and the South Manchuria Railway Company. Chief staff officer Okamura attended the function as deputy of General Terauchi. During the process of the work Prince Chichibu, and other Princes of the Blood visited the scene and inspected the work, encouraging the workers. It may be remembered that the construction of the bridge took three years by German engineers. The repairing work of the same bridge, almost tantamount to building a new bridge, was completed in four months. Although the difference of time during which science has made remarkable progress must be taken into consideration, yet this rapid completion of the work is something to be proud of, and it was due to various factors typically Japanese, including the able direction of the Military and the South Manchuria Railway engineers as well as the self-sacrificing spirit of the workers. In this way the emblem of the victory of Japan's modern science has been established on the Hwang River, and will long commemorate the work.

The Riches of Manchuria*

"THE redistribution of colonies" was the scheme conceived and advanced by Col. House of America in 1936. This scheme was brought up by the author as an effective preventive of war and attracted no small attention, besides creating a good deal of a sensation. "Apart from being a preventive of future war," argued the author, "the redistribution of colonies ought to be carried out, taking into reckoning how matters had stood before the Great War. It is essential that all inequities incorporated in the Versailles Treaty should be set to rights. Granting this scheme to take tangible shape, that would further counteract the world depression now obtaining as an offspring of the uneven distribution of wealth amongst the Powers."

This same scheme found a hearty advocate in an English critic of note.

This proposition stands out in bold relief for enormity of conception and also for its originality, although, from an angle of practical politics, it looks a dubious possibility. As a matter of cold fact, the colonies are indispensable to the existence and prosperity of the capitalistic nations like Great Britain, France, etc., as suppliers of necessary materials and also as markets for products of their mother countries.

The United States of America and Soviet Russia are the only Powers that put their colonies on a level with their inherent territories. With such prolific races as the Italians and the Japanese, the colonies also play the important rôle for their surplus population to emigrate to.

Germany alone is conspicuous for the loss of all her colonies in terms of the Versailles Treaty, and now that many substantial clauses of the same Treaty have become revoked automatically in Germany's favor, she might further be entitled to a measure of fair play on the problem of her lost colonies, too.

Theoretically speaking, Col. House's plan might have a more practical, applicable value with a maiden land that belongs to no country. Still there exist no such areas on the face of the earth excepting the bleak, desolate ice fields around both Poles. After all has been said, the nations that come under the head of "Haves" would be expected to part with portions of their precious colonies gained through the Peace Treaty.

Carefully surveying the world map, any one of sober, matter-of-fact mind will easily tell with what unfair, impossible disregard of the size of population, the nations have their geographical boundaries demarcated.

Unprovoked invasion lies of course under a ban beyond violation, and is out of the question. But the nations that are included in the class of "Have-nots," too, holding as much rights to exist and prosper as the luckier "Haves," as such must no doubt be God's will, the luckless "Have-nots" might demand such extra territory and resources that are needed to sustain their races. Otherwise, they would be doomed to decay and final extinction sooner or later, which can never be in God's benevolent plan.

Japan and Manchoukuo

Japan has, through the will of Providence, practically established her first voice on the Korean Peninsula through the Sino-Japanese War (of 1894-'95), and that on Manchuria by the Russo-Japanese War of one decade later (1904-'05).

In consequence of the Manchurian Incident (of 1931), Manchuria has got rid of the old feudal lords. Upon the ruins of the putrefied feudal system has been built up the new Empire of Manchoukuo composed of five different races, viz., the Manchus, the Chinese, the Japanese, the Mongolians, and the Koreans, with the Japanese posing for the guiding leader to the other races that are tied fast to one another by a bond of common interest, concord, and national code.

Thus, the young State of Manchoukuo has entered into an indivisible relation with Japan on the national motto of "One Mind and Heart."

With Soviet Russia bordering on Manchoukuo all along the length of 4,000 kilos., besides the fast Reddening China (now redeemed by nearly three-quarters through Japan's Herculean efforts) lying contiguous right along the western frontier, the new

Empire could never hope to get along so well as she has been fortunate to do but for the strong, never-failing support of Japan.

In happy contrast with Japan, Manchoukuo is endowed abundantly by nature and may be classed as one of the favored "Haves."

Japanese civilization has germinated, sprouted, developed, and borne fruit during these 2,600 years or longer in the midst of the ultra-niggardly endowments by nature. Housing quarters, for instance, are necessarily built in the simplest style among the civilized countries. So are the diet system and clothing, to boot.

These simplest styles of popular living must have reacted upon the racial character and spirit, affording facility to preserve their lucidity and integrity.

In order to adjust herself to international capitalism now prevailing all the world over after the industrial revolution it has come through, Japan has got to move up herself by all legitimate means to contrive to get above the lot of the "Have-not" and to join the list of the "Haves" from the dual standpoint of national defences and industrial economy.

Subterranean Resources

All plans of industrial development by modern States must revolve around the axle of mineral resources. A nation's consumptions of iron and coal might be held up for the barometer of her prestige and status.

Among Japan's mineral resources may be mentioned coal and copper, the others being practically negligible. Even coal and copper fall a long way short of satisfying the domestic want. As to iron of foremost importance, a meagre reserve of it is found in Chosen (Korea), but practically nil elsewhere. The comparative figures of Japan's mineral products with those of the entire world for 1936, as appended hereto will be an eye-opener.

	Japan's outputs Ton	World's outputs Ton
Gold	21	850
Silver	298	7,400
Copper	78,000	1,527,000
Lead	7,000	1,450,000
Zinc	34,000	1,460,000
Iron ore	516,000	—
Coal	41,000,000	1,240,000,000
Petroleum	350,000	246,369,000

Japan's gold production was no more than 1/40 of the whole world's. As to silver, with which her percentage was higher than that for any other mineral, the rate was 1/24. Regarding petroleum, the figure was the most depressing, it being only 1/700.

As is well known, Japan has to import from abroad the totality of raw materials for the textile industry. The case is just a bit better with mineral resources.

Let us now turn to Manchoukuo and note in what plenty the estimates of her mineral resources are.

	Tons
Coal	15,000,000,000
Iron ore	1,200,000,000
Oil shale	5,400,000,000
Fire clay	100,000,000
Magnesia	5,000,000,000
Limestone	1,700,000,000
	Yen worth
Alluvial gold	4,500,000,000

The entire coal reserves of Japan are placed in the neighborhood of 16,700,000,000 tons, of which 1,000,000,000 tons are estimated to have already been mined since the early Meiji Era.

In Hokkaido, for instance, a portion of the collieries is still left for operation under favorable mining conditions. As to the remainder, a large part is nearing exhaustion.

Moreover, the coal mines are scattered about here and there, few of them in an extensive seam. In the cases of Ube colliery (not far from Shimonoseki) and some along the seacoasts of North Kyushu Island, a number of them have their underground passages running out underneath the sea-bed. Such being how Japan's

*From the *Manchuria Daily News Magazine*.

coal reserves stand, that are comparatively far above the average, what is the status of the rest might be better imagined.

In geological formation, Japan holds mineral products of varying kinds, but precious few of them exist in an enormous quantity. On this account, for the principal minerals required for heavy industry, imports from abroad have to be depended upon, raising in the way of industrial Japan a difficulty not to be easily surmounted.

To contend with this difficulty, arrangements must be completed with the State of Manchoukuo to supply to Japan the latter's requisites. Unlike Japan, in geological formation, the mineral products of Manchoukuo cover a smaller range than those of Japan, but are far superior in quality and more bountiful in amount.

It seems a Providential intervention that, with the only exception of petroleum, what are found short in Japan all occur in Manchoukuo in an amount not only sufficient but leaving considerable to spare.

Among such minerals may be mentioned iron ore, coal, fire clay, magnesite, oil shale, talc, asbestos, dolomite, etc., that furnish fuel, besides materials wanted for iron manufacture and light-metallic and other industries. For other advantages, they all admit of easy mining with labor obtainable at a low schedule.

We shall now proceed to take up the leading mineral resources of Manchoukuo one after another.

Iron Ore Reserves

As a metallic material, iron commands the broadest range of uses and is invested with primary importance industrially. In fact, the magnitude of its stock available has a direct bearing on the destiny of a nation.

Concerning iron ore reserves, Japan is possessed of 80,000,000 tons, to which being added what have been struck recently in Chosen Peninsula, the grand total is placed at 400,000,000 odd tons against which those in Manchoukuo are put at not less than 1,500,000,000 tons, as already noted.

The iron veins are distributed about Anshan (the seat of the Showa Steel Works), Kungchangling Pass, and Miaoerhkou, along the Mukden-Antung Line, and on the north-eastern banks of the Yalu. The ores, like those occurring in North Chosen, come under the heads of hematite and magnetite that are often called "striped iron ore."

The volumes of the ore reserves, as worked out by professional experts, follow, the unit being 1,000 tons:

About	Rich ore	Poor ore	Total
Anshan	1,300 (50-60%)	456,400 (35%)	457,700
Miaoerhkou. . .	3,000 (60-68%)	227,000 (33%)	230,000
Kungchangling ..	3,000 (60-68%)	377,000 (40%)	380,000
Elsewhere	100,000	2,490,000	2,500,000

Of the above, such as have already been worked are those about Anshan and Miaoerhkou. The mine about Kungchangling was left unworked for long, but was placed under Manchoukuo-Japan joint management in 1933, and its operation has already been put in hand.

The iron mines located in Tunghua Province in the Eastern Frontier District have been confirmed by competent technical researches conducted recently as one of the richest boards of iron of fine grade in the world. Adjoining the mines, a colliery is found yielding coal that readily cakes, highly suited for blast furnaces. Then, the iron contents are exceptionally high in percentage, sometimes rising up to 72 per cent, accepted as the theoretically highest. Such an ore of high iron percentage is nearly as good as iron and might have a handle just fitted thereto to make a hammer, for instance.

There is more to be said: The ore containing manganese facilitates the iron manufacturing process.

Generally speaking, the iron ore veins in Manchoukuo occur in extensive quantities. In addition these ores, being more susceptible to a smelting process than others of their kind, will take a less amount of coke, lowering by that extent the manufacturing cost belong the general average in the United States of America, Germany, etc.

Magnesite Deposits

Beds of magnesite are found distributed about Tashihochiao, the junction on the S.M.R. Main Line, with the Yingkou branch line, and over the hilly country at the east of Haicheng Prefecture adjoining. The principal beds lie about Chuanshantzu, Niuhsintai, Penhsihu (on the Mukden-Antung Line), Kuanmashan, Sheng-

shuissu, Sungchiaputzu, Taling, etc. Their total reserves are roughly placed at about 5,000,000,000 tons. The finest in quality is credited with 45 to 47 per cent. The beds number forty or so, of which eighteen lie under operation. In point of both bed area and quality, they are said to defy comparison.

Uses of magnesite were limited to the baking of fire bricks and the manufacture of lignoed, a substitute for linoleum, but a fresh extensive use has lately been discovered as a material for making metallic magnesia which is acknowledged is the chief constituent of light metals indispensable to aircraft manufacture.

Fire Clay Production

No bauxite, the base of aluminium, is found in Manchoukuo. Nevertheless, fire clay of about 50 per cent alumina contents occurs to the extent of about 200,000,000 tons, spread over Fuchou just north of the boundary line of the Kwantung Territory, and Penhsihu, mentioned previously, where is located the Penhsihu Colliery and Iron Manufacturing Co., and Yentai, just north of Liaoyang on the S.M.R. Main Line. In 1936, about 150,000 tons of fire clay were put out, a portion of which finds its way to Japan as a fire-proof material. Now that the Manchuria Light Metal Co. has been set up, it is a question of time when aluminium is produced from alumina of high grade.

As manufacture of iron is established better in Manchoukuo on a permanent and extensive footing, soft fire clay is bound to be next important to iron ore and coal. Like hard fire clay, it is found about Penhsihu, Yentai and Wuhutsui (Fuchou), its total reserve being put at about 100,000,000 tons. Ordinarily, fire clay ranges between Ziegel bore Nos. 34 and 35, but some of the hard species rises to No. 37. What is found about Wuhutsui (or Fuchou) is the finest. Being situated on the sea coast, the output permits of easy shipment, being exported in a considerable amount to the Edamitsu Steel Works and elsewhere in Japan.

Hard fire clay or alumina shale is found, about Penhsihu, Yentai, Wuhutsui, and also about Tachiatun in the Kwantung Territory to the estimated total of 150,000,000 tons. Alumina contents average 40 per cent, but in the case of superior type, the rate ascends up to 70 per cent.

Experiments have been conducted on a factory basis for years past at the Aluminium Experimental Works, Fushun Collieries, of the South Manchuria Railway Co., and the enterprise is to be launched before long at the hands of the Manchuria Light Metal Co.

Coal Industry

As coal takes first place in the mining industry in Japan, so does it in Manchoukuo. Its total reserves used to be figured at between 4,800,000,000 and 5,000,000,000 tons, but since the new Fuhsin coalfield alone has been ascertained to hold 4,000,000,000 tons, the aggregate total is now placed at above 10,000,000,000 tons.

Usually, the estimated mineral reserve of a mine is increased in amount with the progress of technical investigations. This rule applies with greater truth to coal in particular. In Japan, for instance, the aggregate coal reserves were published about 1912 at only about 8,300,000,000 tons. After the energetic exploitation extending over some twenty years since then, the estimated balance, as gazetted in 1932, was made out to be 16,000,000,000 tons!

A like thing may be expected of the coal hoards in Manchoukuo, especially as there is ample possibility of new coalfields being discovered.

To dispose in chronological order, the geological formation of the principal coal beds in Manchoukuo, such as are ascribed to the Subcarboniferous Era yield mainly anthracite, being distributed about Penhsihu, Wuhutsui, Yentai, etc. Those belonging to the Jurassic Era give semi-anthracite of bituminous coal, and are found about Hsian, Patao-hao, Peipiao (north of Chinchow), Fuhsin (west of Mukden), Haolikang (in North Manchuria), etc. What are produced by the famous Fushun Collieries and Jalainor mine (south-east of Manchuli on the Siberian border) are attributed to the Tertiary Era and are either brown coal or bituminous coal.

Up to this, the total coal outputs in all Manchoukuo have been estimated at about 10,000,000 tons a year, mostly from the Fushun Collieries at the respective percentages to the total production, that is, 75 per cent (or 5,364,000 tons) in 1932, 73 per cent (or 6,619,000 tons) in 1933, 70 per cent (or 7,512,000 tons) in 1934, and 65 per cent (or 7,555,000 tons) in 1935.

The gradual decline of percentage, invertedly to the steady increase in production, mainly indicates the increasing mining operations of the Manchuria Coal Mining Co., apart from the Fushun Collieries that belong to the Railway Co.

In Japan, the aggregate coal production is 40,000,000 tons; 4,000,000 odd tons have had to be imported annually, mostly from Manchuria to make good the shortage. The domestic supply is found falling shorter since the outbreak of the Sino-Japanese hostilities. In fact, from the beginning of the current year, the country has had a coal famine.

The expansion of the production by heavy industry being of paramount importance to the adequacy of national defence, an early relief to the prevailing coal famine in the Empire is of urgent necessity. The short cut to apply the sorely needed relief is in the increase of workable coalfields in Manchoukuo, in order to give a greater supply for Japan.

According to the Five Year Industrial Development Plan for Manchoukuo (the current year being the second), the coal yield for the last year of the plan, or 1941, is placed at 38,000,000 tons.

The execution of this program will have happily solved the coal supply problem for both Manchoukuo and Japan.

This puts us in mind of what a distressing industrial dilemma Japan would have been in but for the liberal supply of Manchurian coal to fall back upon.

Oil Shale Reserve

The oil shale overlapping the immense Fushun coal seam averages from 120 to 170 meters thick, with its total hoard being figured at 5,400,000,000 tons. Its oil contents averaging six per cent, the entire shale reserve is expected to yield 320,000,000 tons oil.

In quality of oil and also in the rate of oil recovery, Fushun shale ranks above the average. Its characteristic advantages are several. Aside from the enormity of the reserve, the mining cost is next to nil, its stripping operation being a matter of technical necessity for the miners to reach the coal. The residue left after the oil has been extracted will serve for an excellent and handy filling inside the pits, thereby saving the cost of its disposal. Then, with requisite fuel and labor at easy command, the management enjoys an obvious advantage.

The heavy oil output at Fushun is supplied by contract to the Imperial Navy. They have achieved a further success in improving on the Dabos method of America and inventing a direct cracking system. They are now obtaining volatile oil from crude shale oil.

The oil mill is to have been enlarged to lift its producing capacity to 360,000 tons a year by the current year, 1938. Oil shale is found also in the two Provinces of Sankiang (on the Littoral frontier) and Chientao (on the Korean frontier).

Altogether there might be something like 6,000,000,000 tons of it in Manchoukuo.

Other Minerals

The lead mine at Yangchiachangtzu on the Mukden-Shanghai Line is one of the richest and biggest in the world. The Manchuria Lead Mine Co. has been launched on capital of Y.4,000,000 and will be merged with the Manchuria Mining Co. in the immediate future.

Among other metallic minerals, there are silver, zinc, copper, iron sulphide, managese, etc. As to non-metallic minerals, talc is produced as a sort of adjunct to magnesite in the magnesite beds spread over the two prefectures of Haicheng and Kaiping on the S.M.R. Main Line. Talc is in demand a good deal in Japan as a material for paper milling, silk yarn reeling, manufacture of face powder, etc. Further, natural soda, asbestos, lime-stone, silica, fluor spar, feldspar, etc., may be added to the list.

Granary of Orient

The plenitude of assets Manchoukuo is endowed with as a great agricultural country has been amply proved by a painful shortage of grain store as felt so acutely in China since the outbreak of the Manchurian Incident of 1931 that has cut off the grain supply to China proper from Manchuria which is very often referred to as the "Granary of the Orient."

Indeed 80 per cent of the native population or roughly 25,000,000 people of Manchoukuo fall under the head of farming classes, with 32,000,000 mow of arable land. Of this extensive

arable land, more than half is still left wild, waiting to be reclaimed. The future of Manchoukuo looks very roseate.

Geologically speaking, Manchurian soil mostly consists of alluvium and diluvium, and humus, with but a small percentage of sandy soil. It is more fertile in North Manchuria in which humus soil is practically dominant. The climate is decidedly continental, with the two extremes of cold and heat.

It is also comparatively dry, although, with the steady opening-up of the country, attend with the progress of afforestation work, a marked increase has been noticed in the annual mean of precipitation, especially in recent years.

Still, crude dry cultivation predominates, and a second crop being out of the question in the farming year, a larger area than in Japan is wanted per household, to ensure even a frugal living. Of all popular crops, soya beans and kaoliang, the latter being the natives' staple food-stuff, that can stand dry weather best, are raised most extensively.

Principal Crops

From the dual angle of production amount and economic importance, soya beans, kaoliang, millet, maize, and wheat make up the most favorite crops in Manchoukuo, taking up amongst them 90 per cent of the total. All combined they are called the staple produce of Manchoukuo.

Of all the five kinds of grain, soya beans have already earned worldwide recognition. The major portion of their total yield of 4,000,000 tons is shipped abroad, fetching \$200,000,000-300,000,000 which represents 60 per cent of the entire export trade of the young Empire. Kaoliang comes second, its total production being 4,000,000 tons; millet follows with 3,000,000 tons, maize next with 2,000,000 tons, and wheat bringing up the rear with 1,000,000 tons. They are largely for domestic consumption as food-stuffs or cattle-feed.

Again, there are, besides soya beans other oil-giving seeds like perilla, linseed, castor beans, ground nuts, etc., none of which are yet put out in a considerable quantity, but which are all shipped abroad for the greater part.

Soya Beans

The aggregate total of bean crops in the world is now estimated at about 6,000,000 tons. Their producing centers are, besides Manchoukuo, China, Chosen (Korea), Japan, the United States of America, the Netherlands, East Indies, etc.

As above stated, Manchoukuo by herself putting out 4,000,000 tons, her big share of production goes up to 66 per cent of the world total.

Suppose, with the reclamation of the wild areas left in her realm, her bean production would be doubled to 8,000,000 tons, her position on the world's bean market might be something warranting her to be justly proud.

There remains, however, one outstanding point that deserves very serious consideration.

Beans may be called a ubiquitous crop in Manchoukuo in the course of time with their remarkably increased production that will defy rivalry.

Nonetheless, the best part of the stocks must be exported abroad, as silk yarn for the Japanese.

This means that, on the foreign markets, they are put to competition with other oil-giving seeds like groundnuts, linseed, cottonseed, copra, etc.

All the same, the crop outcome, the amount actually exported, and the market quotations of soya beans cannot escape being matters of direct concern with the living of the Manchoukuo people and her foreign trade balance as well.

To tabulate how the bean outputs of Manchoukuo are disposed of:

	Tons	Per cent
Total production	4,000,000	—
Amt. exported	2,000,000	50
Consumed by domestic mills, etc. ..	1,400,000	35
Domestic consumption	600,000	15

Roughly, half the total output might be set aside for shipment abroad, as indicated in the above table, largely for oil-making material.

Again, of 1,400,000 tons consumed by the domestic bean mills, the exports abroad in the form of bean oil and cake may be rated at 1,000,000 tons, the balance of 400,000 tons being for domestic consumption.

On the basis of the above calculation, 75 per cent or 3,000,000 tons of the entire bean production in Manchoukuo is shipped out of the country in the form of beans, bean oil or cake, the remaining 25 per cent or 1,000,000 tons representing net domestic consumption.

Other Crops

Kaoliang. This kind of grain, as already stated, is an article of staple food for Manchoukuo. A good deal is for distilling "shumshu" a favorite spirit for the plebeian classes, and some for cattle-feed, too. Most of the total yield of 4,000,000 tons is consumed at home, what is exported being only 200,000 tons.

Having established a reputation for excellent cattle-feed even in Japan and China, any increased kaoliang output is sure of finding a ready market.

Kaoliang stalks that are tall and pretty stout serve for building material for the natives, or are woven into mats, further furnishing an article of fuel.

Recently, kaoliang stalk have found a new and promising use as a material for pulp-making, and it has remained a subject of close technical research.

Maize. Maize is another principal food-stuff for the natives of Manchoukuo, only second to kaoliang in importance. A couple of fresh uses have been discovered lately as material for making starch and alcohol. It is in considerable request as fine poultry feed. Out of 2,000,000 tons put out, what can be spared for export is not more than 80,000 tons and it will never be a drug on the market even in case of its production increasing apace.

Wheat. North Manchuria is widely conceded as suited to wheat cultivation. North Manchurian wheat is rich in protein and also gluten. In one of the years of general crop failures abroad about 1919, North Manchuria shipped out over 400,000 tons. As matters stand, the output is not above 1,000,000 tons and that falls short of meeting domestic need.

Wild Cocoons. They are raised in South Manchuria, particularly about Antung. They have now outstripped Shantung, China, the original wild sericultural center, Manchuria is and now perhaps the heaviest producer in the world. The annual crop ranges from 5,000,000,000 to 9,000,000,000 grains, giving an average of 7,000,000,000 grains. The major portion of the yield is shipped to Japan in the form of tussah silk yarn, fetching \$20,000,000 or thereabouts. From Japan, it is placed on the Western market as pongee silk.

Others. Among other farming produce, millet is sent to Chosen where it serves as staple food among the Koreans.

The rice-output in Manchoukuo has been remarkably increased in late years through the reclamation of marshy areas into paddy-fields by Korean farmers who have immigrated. To these may be added other oil-producing seeds like groundnuts, perilla, sesamum, castor beans, cotton seed, etc.

Virgin Forests and Timber Famine

Glancing over the import trade returns of Japan in 1937, timber takes eighth place, with Y.64,000,000 after Y.849,000,000 of raw cotton, Y.298,000,000 of wool, Y.121,000,000 of scrap iron, Y.116,000,000 of pulp, Y.103,000,000 of crude oil, Y.83,000,000 of mineral materials, and Y.75,000,000 of soya beans.

Pulp being made from timber may be added to the timber figure of Y.64,000,000, lifting the total to Y.180,000,000.

Small wonder that, while the revival of foreign trade and the reduction of imports from abroad are the popular rallying cries in Japan, any cutting down of timber and pulp imports will help to improve Japan's foreign trade balance.

In Japan, trees thrive in exuberance, but, being severely handicapped with the limited area of territory, her forestry assets are of very indifferent magnitude, as might be noted from the table appended hereto, giving the forestry resources of the leading Powers.

	Forest area unit: 1,000,000 acres	Whole territorial area	Forest %	Timber pro- duction (mean of 1926-28) unit: 10,000- 000 cub. ft.
Soviet Russia	1,914	4,290	45	1,323
Canada	602	1,830	43	283
The United States of America	404	1,552	26	3,180
Sweden	46	68	68	138
Germany	26	94	27	178
Japan	76	136	56	65
Manchoukuo	44	260	17	46

A casual glance at the above table might give the impression that Japan is a heavy importer of both timber and pulp, with Manchoukuo even, her timber yields are far from reassuring in quantity by the side of her mineral and agricultural resources that are in abundance.

The agricultural industry being predominant over all else of Manchoukuo, the major portion of arable land accessible heretofore is appropriated for cultivation, although there is a very extensive area left for reclamation. As the above table indicates, the forest percentage to the whole territorial area is the lowest of all, with only 17 per cent.

Compared with Japan, Manchoukuo is four times as large in area, but her forest area is less than 60 per cent of Japan's.

Because of this, the forest assets of Manchoukuo, if taken separately might not count for much, but when combined with that of Japan, the sum total of their timber production might rise to nearly double Japan's own.

Thus, by forming an economic bloc between the two nations, they may be enabled to manage to curtail substantially the importation of timber and pulp.

Pulp-Making Materials

Manchoukuo has a forest area of altogether 21,943,000 mow containing 1,477,000,000 cubic meters of coniferous timber and 2,228,000 cubic meters of deciduous timber.

According to botanical zones, Manchoukuo is situated to the north of the Temperate Zone and the Frigid Zone, containing 350 kinds of trees, of which nearly twenty species belong to the class good for both timber and pulp-making material.

The total timber wealth of Manchoukuo, immediately after her advent, was estimated at 28,000,000 cub. ft. which, under the care of a wide awake forestry administration on top of receiving a stimulus from the bustling construction activity, that has been kept up since the start, was raised to 46,000,000 cub. ft. by 1935. At any rate, imported timber for the same year, 1935, was brought down to 18,000,000 cub. ft. from 26,000,000 cub. ft. of the preceding year, 1934.

The demand for pulp in Japan ten years hence being expected to come to between 2,000,000 tons and 2,500,000 tons, Manchoukuo is depended upon to supply whatever shortage may be left.

In consequence, a remarkable increase in pulp production is planned in the revised Five Year Industrial Development Plan for the State of Manchoukuo. By 1941, the last year of the plan pulp output is expected to reach about 400,000 tons.

Thirty Years Afforestation Scheme

With the advance of technical investigation, the authorities concerned of Manchoukuo have drawn up a scheme for afforesting 27,100,000 mow on a 30 years' program, starting with four years' immediate program for 1,000,000 mow, as specified under:

For	Mow
1938	80,000
1939	200,000
1940	320,000
1941	402,000

An annual increase in the newly afforested area being on the program, the treeless areas of 65,000,000 mow out of altogether 87,000,000 mow of wooded areas seem destined to be clad in verdure, as the case was experimented upon with phenomenal success in Germany.

Future Vista

We have tried above to import a fairly clear idea of how handomely Manchoukuo is endowed by nature in mineral, agricultural, and forestry resources. These are not all either, for Manchoukuo to exploit.

Live stock raising is still another asset that should not be slighted or overlooked.

The hydro-electricity enterprise about to be launched on both the Yalu (running along the Manchoukuo-Chosen frontier) and the second Sungari will each serve as a source of motive power to divers chemical and manufacturing industries, to arise turning Manchoukuo into an industrial as well as an agricultural country.

Again, reeds, bean pods, and kaoliang stalks have found a fresh use as pulp-making material. Their indigenous supplies are

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New Deal in New Zealand*

By QUENTIN POPE

APPROACHING the end of its third year under Socialist rule, New Zealand is taking stock. Generally speaking, it likes the results. There has been more pay, greater leisure, a spending spree. After twenty-five years of moderate government, this British colony in the South Seas has found the New Deal like getting money from home.

On Saturdays one sees early morning crowds departing for the golf courses. Once again one sees throngs outside the newspaper offices, waiting for the noon editions as they did before the depression. And once again there is a chicken in almost every pot. Nearly every day a new government plan reaches out to include more workers, or an old plan is extended into fresh districts.

The moderates, who were defeated three to one in the last election, were silent for a time, but they have been recovering morale; and as they have done so they have begun to attack the Socialist policy. But it is uphill work. The Socialist program was launched on a rising market, the budget is as reasonably balanced as it ever is in this country and criticism goes unheeded. Life is too good.

The fact is that here, at the bottom of the Pacific, 3,000 miles south of Honolulu, a new political experiment is being tried out. New Zealand has lived a planned life since it was colonized a hundred years ago, and at one time Andre Siegfried, the French economist, was brought here to examine the program. But to-day social innovations hurry toward the novel so fast that even New Zealanders wonder what will happen next. And once again a socially conservative, politically adventurous people, bothered by the din of a buzzing legislative machine, gets a pleased sense of importance from the world's attention.

Country is Isolated

Girdled by ocean, New Zealand is set in an isolation which has had curious effects on her national life. For decades she has been bound by ties of blood and trade and sentiment to Great Britain. She has been dependent upon the motherland for markets for her vast shipments of meat and butter and cheese and wool, for the carriage of these goods to their destination half-way around the world, for the banking structure which would finance these transactions and the inevitable trade with other lands, for the loans which have poured in a golden stream from London to open up new lands, build railways and highways and create a great hydro-electric power structure, for the major examples of the arts and food for the life and mind, even for news and interpretation of the news of what the rest of the world is doing.

But in this isolation she has been increasingly content. And well she might be, for here in the Pacific has arisen one of Britain's few examples of scientific colonization, now among the richest communities in the world.

Blessed in soil and climate, with a short Winter free from storms, New Zealand was probably the best home for Europeans outside Europe. Wellington, the capital, is cut by a line of latitude (south) that approximates the latitude (north) of Madrid. The territory toward the Equator, green with forests and farm ("the Winterless North"), compares with the coast of Morocco; the south, colder, more familiar with snow, less rugged in outline, with people more dour and less brisk in business, is similar to Brittany. But the whole country is cooled by the sea winds which blow from oceans never distant in this long, narrow land, greened by frequent showers, haunted by no pests worse than the wild pigs and deer and gorse which Western man brought with him, and returning rich dividends to those who work the soil.

In New Zealand's length of a thousand miles is concentrated a strange medley of scenes as if the world smiths had wished to make a playground for themselves after their labors were ended. Vast forests of stately kauri pines to the north yield to a bubbling, steaming hell, where geysers play and roaring blowholes spout in never-ending turmoil. Volcanic cones carry their lazy wreaths of smoke above a countryside fertile and tidy and smoothly rolling and dotted with the stock which sends Britain almost one-quarter of her butter and cheese.

Craggy mountain chains stand above the great plains of the South Island across a strait of turbulence. There, running down the westward edge of the island like a vast spine, is the Southern Alpine range and the rich mining territory known as the West Coast. And southward again, over low, rounded hills, one comes to cold lakes of austere beauty, goes from Switzerland to Scotland, only to find at the southern extremity of the country that the coastline is fretted with innumerable fjords, each with its bevy of snowcapped mountains.

Blessed with Resources

This is what awaited the advance guard of the New Utopia who fled the depressed lands of Europe in May, 1839, after Edward Gibbon Wakefield had formed the New Zealand Association. "We are, I think, going to colonize New Zealand, though we be doing so in a most slovenly and scrambling and disgraceful manner," he had said before a House of Commons committee on disposal of waste lands in the colonies during the previous year. Wakefield achieved his plan for the acquisition of the land despite the opposition of missionaries who feared the bad effect which the contact of white settlers might have upon the savages who had held it for centuries.

Later, gold, first in Australia, then in New Zealand, brought the ravening crew of miners who had invaded California ten years before, and with them came immense stimulation to the farming industry, for they must be fed. But in these early days the wealth of the country was in grain and in wool. When the stimulus given by the gold rushes, which brought more capital into the country than they took out of it, had spent itself, there was a program of borrowing for development, of public works and of general expansion. It broke down and the long "hungry Eighties" settled upon the land.

At the dawn of a new decade a people sickened by years of rigid administration had determined to revolt; they gave the radical Liberal party overwhelming command of the Legislature. It was the beginning of that radical tradition in politics of which New Zealanders later were to grow proud. The radicals decreed that all labor might unionize, that industry must argue its disputes before an arbitration court whose decisions should have the force of law, that strikes and lockouts must vanish before the force of reason.

They pioneered with adult franchise, with old-age pensions, with free and compulsory education with an eight-hour day and forty-four-hour week and launched an offensive to convert big estates into small ones.

The Liberals held power from the early Nineties till just before the World War. For a generation after that, the dominating force in the country was William F. Massey, who aided the collective efforts of the farmer against the unions and against manufacturers who clamored for higher tariffs for factory products. But even under the eye of this rugged individualist, State activity grew and he inherited State railroads, mines, insurance business. His party pushed on to establish a State scheme of hydro-electric power on a basis of national coverage.

By the time of the bursting of the bubble of post-war prosperity, New Zealand was at the head of the world in its per capita exports. The tradition of organization had built up milk-products industries unsurpassed in the world and placed their output on foreign markets at prices others could not approach. A specially evolved type of sheep brought wealth from meat and wool and the stream of goods passing overseas brought back a stream of other goods. Soon in automobiles, in telephones, in movie theaters, New Zealand stood second only to the United States. Her people had sun, freedom of movement, plentiful food, insatiable appetite for sport and ample opportunity for it as the stream of wealth widened and deepened. The one weakness in the situation was the fact that the stream of loans from London widened and deepened, too.

* In the *New York Times*.

New Economy

When the depression hit, the government tried to pull through the demoralized country by the familiar British method of ruthless economy. After winning one election, it faced a country irritated by minor oppressions, resentful of a policy of paring. At the end of 1935, the indignant electorate drove the moderate combination of agrarians and Liberals from office.

From early 1936 Labor set out to create a new economy. In certain directions it was no more than an extension of the policy of the past, but in its farthest implications it stood for two things: the belief that a fresh prosperity could be built in a country which could be isolated from outside influences, and the improvement of the lot of the common man.

The expedients familiar to the New Dealers were all here. Public works, long restricted, were pushed ahead at a rapid pace. Railroads began to creep through new country once again and huge State buildings reared their heads. A great housing plan was announced which would end the shortage of dwellings due to the slump building stoppage, and do it by the use of public credit. State money was voted to aid training the new recruits to the ranks of skilled labor, now painfully short after the lack of employment in the depression years.

State control of some forms of minerals was acquired. In the fields of labor and industry, enormous changes were made. The old arbitration court, virtually crippled by the moderates, was returned to power and given authority to award the forty-hour week to every industry that could afford it. Government action restored all payrolls to the 1929 level at a stroke. Unionization was extended from the ranks of unskilled labor and craft workers to include professional and semi-professional classes, who for the first time gained fixed wage scales and limitation of hours. Farm labor was subject to standards for the first time in history.

Toward industry a vigorous policy was pursued. A new Bureau of Industry was created for manufacturing plants, a blue-print organization to prepare plans of the way in which production was to develop. Concurrently, the government set out to find every man a job. To make possible these elaborate plans, the Socialists took command of the National Reserve Bank and set up a big State lending department.

Up to now the impact of this making over of the national life has been so great there has been little time for analysis and reflection. Conservatives were strengthened by the knowledge that the economies of the depression piled up enormous reserves in London banks—enough to finance the whole budget for almost

two years. But as the New Deal progresses and the source of its finance remains a mystery, as the Socialists continue to spend without raising foreign loans or apparently drawing on these great London balances, disquiet is felt.

From all over the country there has risen the clamor of industrialists pointing to the rising of a new import flood. The farmers welcome it, declare it a sign of wealth. The manufacturers tell stories of lessening orders, of staff laid off, of a strange slackening of activity at a time usually their busiest. Customs figures bear them out—the record rise in exports has been accompanied by one in imports and the credit margin remaining is small. Milk farmers protest the new season's guaranteed price as too low. The government has to move to protect industries which have had their output lowered and their costs raised by labor's New Deal. Slowly it begins to emerge that the Socialists' isolating of New Zealand from the world may be accompanied by a system of import quotas or trade restriction.

Mounting Prices

All the time the marching costs mount higher. In a single year the Socialists raised the budgetary taxation from \$125,000,000 to \$150,000,000. Higher wages, shorter hours, have brought higher production costs, and every week something advances in price. Now the pressure is beginning to be felt by the workers and soon there will be demands for higher wages. Just where that cycle will end depends on the government's financial policy. There is wide disagreement as to what will be done.

Attempts to estimate the rate at which the reserves are being used up vary with the degree of the pessimism of the calculator and his dislike of the Labor government. But there has been general agreement that the Labor administration will be in power after next election, that it will probably survive the 1941 election and that the real test will come in 1944. Much, though, depends on a vast new social security scheme, giving pensions and health services to all, which has aroused much opposition.

Meantime a vast new social structure is being erected here. Already there is a different atmosphere resulting from the fact that men no longer fear unemployment, and that unionized labor knows that it cannot be beaten in a duel with the employers.

Soon the social security of every worker on the line below \$1,500 will be much greater. And people feel that the advantages will stay because the moderates will not dare to undo them. With fresh faith in themselves, after almost three years of power, New Zealand's Socialist rulers face the future.

Portents of the Future in China

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that the company which will have its head office in Shanghai and will operate as a holding company. It aims to develop almost every branch of commercial enterprise, including railways, waterworks, power-plants, shipping, mining, telephone, telegraph and wireless systems. The company's first task, he further said, would be to reconstruct damage resulting from the hostilities, and the second to develop entirely new enterprises. He emphasized that Japan has no idea of monopolies, but would welcome foreign operations and never seek to eliminate existing foreign enterprises. He lamented the fact that foreign powers without showing a sympathetic understanding had rather been unfriendly, and he hoped that they would change their attitude in future; otherwise friendly co-operation would be well-nigh impossible.

It seems from Mr. Kodama's remarks that Japan does not intend to monopolize trade and industries, not only in Shanghai but in China, but the foreign powers have rather lacked the spirit of collaboration by showing an attitude which has been anything but friendly. It may be of essential importance that a thorough understanding between Japan and the foreign powers should be established before any third power investments be made, for confidence is the *sine qua non* of any business transaction and that confidence can only be restored by a good understanding as regards respective intentions of those concerned.

The Riches of Manchuria

(Continued from page 415)

calculated to turn out altogether 1,000,000 tons of pulp. Reeds and bean pods have already been put into actual use on an industrial footing. Minor items of industrial value already set in operation or in project would fill quite a volume for us to touch upon.

The State of Manchoukuo had her Five Year Plan started last year, but, in order to fit better in with the extraordinary wartime system as the hostilities with Chiang steadily expanded, the same program has become radically readjusted the better to suit the purpose of Manchoukuo-Japan, beginning with the current year. As an outcome, the grand scheme to open up the rich natural resources of Manchoukuo has been expanded to a broader scale for quicker execution.

Through the happy consummation of the new scheme, Japan, co-operating with Manchoukuo, will have acquired adequate strength and power to establish themselves as the perpetual stabilizing lever of the orient in name and in effect, equipped with sound strategic security proof to exterior assault or transgression.

Things depending so much upon the successful carrying out of the great Four Year Economic and Reconstruction Programs of Japan and Manchoukuo, respectively, this stern fact must never be allowed to be lost sight of in Japan and Manchoukuo. At the same time, what paramount significance is possessed by the dormant resources of Manchoukuo, waiting to be opened up, ought to be fully appreciated as they deserve.

A Letter from Manchoukuo

By An Onlooker at Hsinking

At the time when the whole world is seized with extreme uncertainty as to the preservation of peace it is natural that gold should occupy a very important position among the factors which are essential for the successful execution of hostilities by any Power, and for that account every Power is encouraging gold-producing industry. Herein is presented a survey of the industry in Manchoukuo, for it is enjoying the closest attention of the Government in view of the fact that Japan, its allied country, has no promising future as regards the increase of gold production.

North Manchuria and the Russian Amur regions are known as the two greatest gold producing districts in the Far East. No great amount of capital has, however, been invested for the industry so far, simply because general unrest prevailing in these regions, together with lack of transportation facilities, has daunted the development of the industry on a big scale.

Before explaining the new enterprise for producing gold which has been launched by the Manchoukuo Government it will be interesting to draw the attention of the reader to the gold reserves which remain dormant under the ground in Manchuria.

Mineral reserves and agricultural products are the two greatest items of resources in Manchoukuo. Of the latter, alluvial gold in North Manchuria and gold mines in South Manchuria are most important. Gold is found throughout the whole of Manchoukuo. Of the total area of 1,300,000 square kilometers, the gold-containing zone occupies 100,000 square kilometers. Torgasheff, B. P. a Russian geologist, in his work "The Mineral Industry of the Far East" says: "In North Manchuria gold is chiefly preserved in recent alluvial river placers or terraces which are being worked as belonging to this recent alluvial. The old alluvial is also found in many parts of North Manchuria. The exposed granite and gneiss in the branch rivers of the Sungari, Amur, Usuri, Aigun are believed to contain gold, and specially Jurassic conglomerate which contains gold, according to the discovery of the Russian expert Baron Aminov, is dispersed in many parts of North Manchuria."

As regards the amount of gold reserves in Manchuria, Torgasheff says: "Geographically North Manchuria is still under investigation and it is impossible to make an exact estimation of the gold reserves, but doubtless an exorbitant amount of gold must lie dormant unexcavated. According to Ahnert, E. E., a Russian geologist and explorer of Manchuria, the alluvial preserved in North Manchuria extends at least over 3,000,000, kilometers."

In June, 1932, the Manchoukuo Government placed mining industry covering seven kinds of mines including gold mines under

government control. In 1935, the government issued a new mining law by which foreigners or foreign juridical persons are permitted to engage in mining industry. In May, 1934, the Manchurian Gold Mining company was organized. The company is under joint management of Japan and Manchoukuo. The capital of the company is put at Y120,000,000, jointly subscribed by the Manchoukuo government, the Manchurian Railway Company and the Oriental Colonial Company. The company monopolizes new gold mining rights in the special mining districts. The mining districts which are not under the direct management for the company can be leased. In short, the company performs the function of a central organ for gold mining, and it also gives monetary or technical assistance to those who have already acquired mining rights. The company acts as an agent of the Central Bank for purchasing gold through official quotations. The following mine companies are under direct supervision of the company.

The North Manchurian Gold Mining Co. (paid capital Y2,000,000), The Hailar Gold Producing Co. (paid capital Y300,000), The Ta Tao Co. (Y4,000,000), The Yenho Gold Mining Company (Y600,000), The Jehol Mining Company (Y300,000), The Great Manchurian Gold Mining Co. (Y50,000), The Jehol Mining Company (Y600,000), The Manchurian Mining Co. (Y500,000) and the Ta Tao Productive Industry (Y3,000,000).

The Manchurian Gold Mining Co. supervises these lesser companies. The company has its main office at Hsinking. In accordance with the five year plan for gold production in Manchoukuo the company is planning the production of gold as is shown by the following table:—

	Amur districts	佳木斯	Hunchun	間島地方
1937 ..	Y6,460	Y6,840	Y1,500	—
1938 ..	9,350	10,490	2,330	—
1939 ..	15,390	15,830	3,500	1,800
1940 ..	21,830	25,130	5,250	3,600
1941 ..	32,430	37,000	7,870	5,400
Total ..	Y85,460	Y95,290	Y20,450	Y10,800
Grand total Y212,000				

The above table only covers the mining fields belonging to the Manchurian Gold Mining Co. The gold mineral resources in Manchuria have not been tackled with on an extensive scale, as they should, owing to several causes, including uncertainty about maintenance of peace and order in the mining districts, lack of



Peichatzu gold field, center of placer mining in the Chientao area



Showing one stage of placer mining in Manchoukuo after boring tests of first stage

communications and transportation facilities, insufficiency of capital and small yield of profits, etc.

With a view to rapidly increasing gold production the Manchoukuo Government will shortly carry out the expansion of the business system of the Manchuria Gold Mining Co., so that the amount of gold to be produced under the five year plan, namely Y300,000,000, will be far exceeded.

The Pulp Industry

Next to gold producing industry, pulp industry is making great progress in Manchoukuo owing to the ever increasing demand of staple fibre which is superseding cotton and wool in Japan.

The pulp industry in Manchuria was planned on several occasions during the reign of the Manchurian War-lords, but it failed to take visible shape owing to political and financial troubles. After the Manchoukuo state was organized paper-milling industry began to be revived, and naturally the pulp industry was given a great impetus. In the spring of 1937, the Manchurian government authorized the establishment of four pulp manufacturing companies which are: The Japan-Manchoukuo Pulp Co., The Eastern Manchoukuo Pulp Co., The Oriental Pulp Co., and the Manchurian Pulp Co., limiting the production of pulp of each company to 10,000 kilograms a year, and supplying necessary wood for it. The trees used for pulp production are needle-leaf trees like silver firs, and *abies sachalinensis*, etc.

Recently wild reeds grown at the banks of the Lyan, Yalu and Sungari are being used for the raw material of pulp, and a company was established in 1936 for the purpose.

As compared with the pulp industry in Saghalien the same industry in Manchuria is in less favorable condition owing to the inferior quality of wood, and difficulty of transportation, but Japan, which is short of material for pulp must rely upon Manchuria for its supply, however unfavorable the conditions for its production may be.

At present Japan demands pulp to the amount of 1,300,000 kilograms of which Japan can only supply 880,000 kilograms. About 400,000 kilograms must be imported from Manchuria. Now the forests in Manchoukuo cannot produce wood for more than 67,000 kilograms, if the measures for protecting forestry from reckless felling are taken into consideration. The pulp produced from this amount of wood is hardly sufficient to cover the above shortage.

The shortage of wood for pulp is a problem common to all the countries. As long as the wood for pulp is confined to fire and pines even in the forestry in Manchuria can hardly meet the demand for pulp in Japan.



Modern gold separation machinery is replacing the former primitive "gold pan"

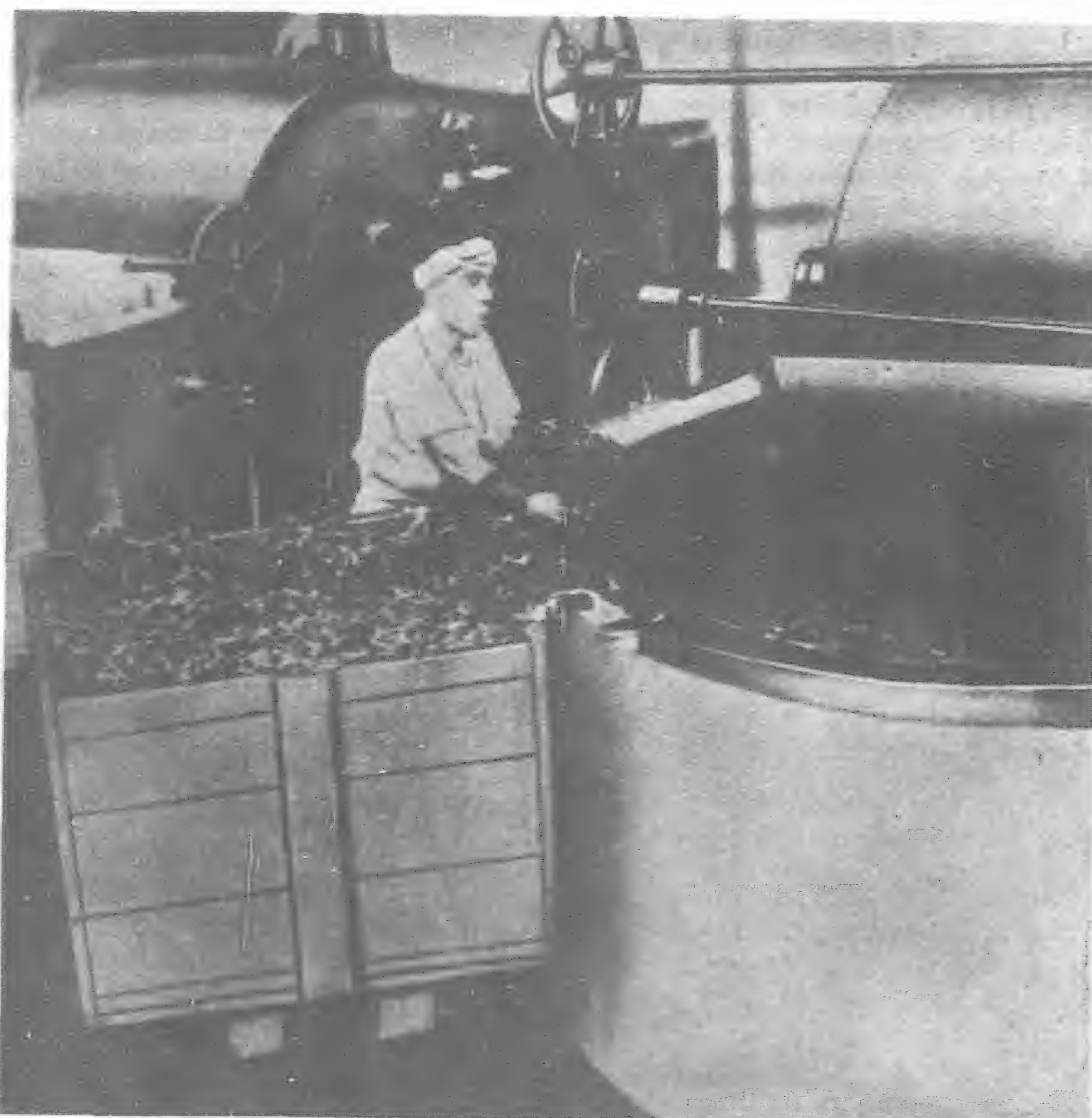
increasing the output of pulp in Manchuria has been launched in order to meet this shortage of pulp in Japan. According to this plan Manchoukuo will be able to supply after five years the pulp for rayon to the amount of 300,000 kilograms, and that for paper 100,000 kilograms. Of this total of 400,000 kilograms 300,000 will be produced from wood, 70,000 from reeds, and 30,000 from bean stalks.

Japanese Immigration

The existence of Manchoukuo is very important as the first defensive line of Japan and in this respect the immigration of Japanese farmers and their families is more significant, not as a release of pressure on the ever-increasing population in Japan proper, but as to strengthening of ties between Japan and Manchoukuo for the common purpose of defence. A plan of immigrating 5,000,000 (1,000,000 families) farmers from Japan in 20 years has been adopted by Manchoukuo concurrently with Japan. By this immigration plan the Japanese residents will form ten per cent of the population in Manchoukuo which will be increased to about 50,000,000 in 20 years.

Six years have already passed since the first Japanese farmers landed in Manchoukuo in October, 1932. At present the total number of immigrants in Manchoukuo is estimated at 11,170. To increase the Japanese colony in Manchoukuo up to five millions in 20 years seems to be a very ambitious plan which

(Continued on page 427)



Showing a process in pulp making. After wood is macerated and treated it is beaten into pulp in such machines as the one shown above

Building of Open Port for Tokyo is Outstanding Project*

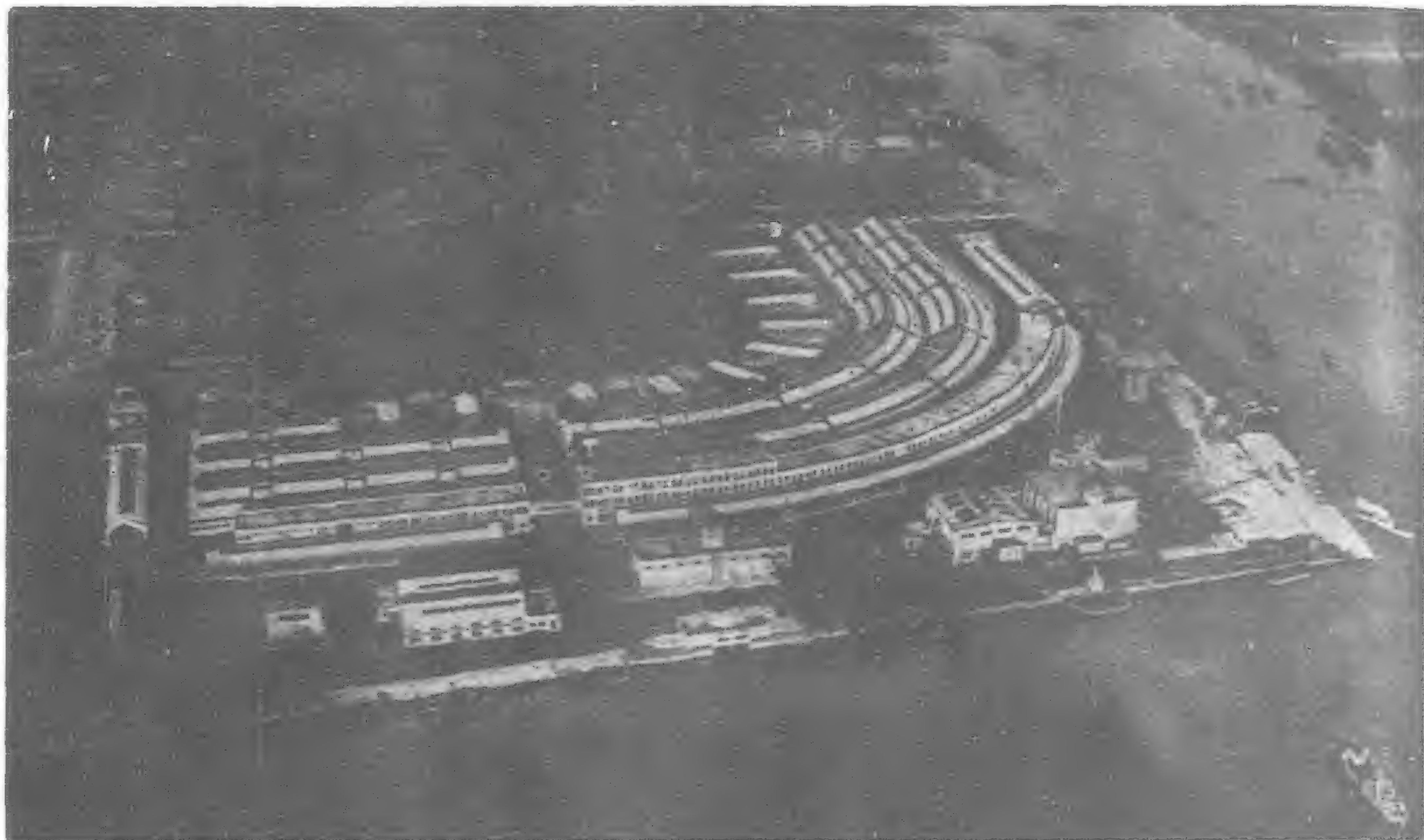
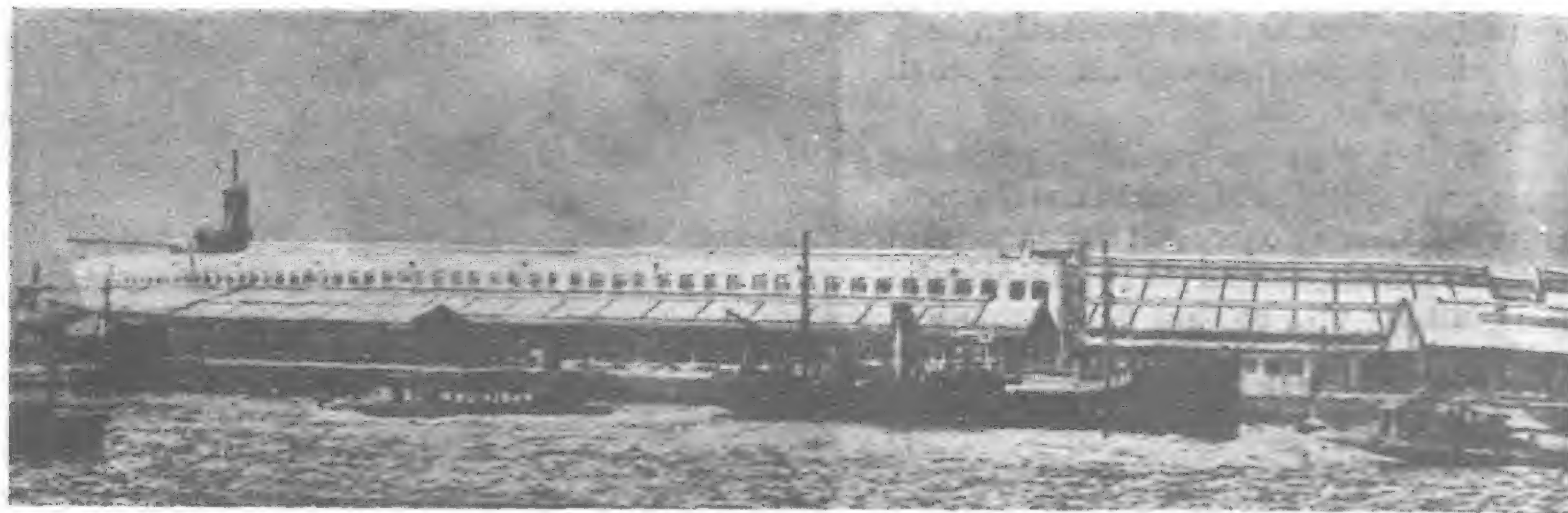
By EI-ICHI-RO SUZUKI (Director of the Harbor Board, Tokyo Municipal Office)

SINCE 1880, the question of the construction of Tokyo Harbor has been discussed in various quarters and many plans presented by interested persons, but due to various circumstances all had been given up. In 1906, however, the City commenced the work of improving the harbor at the mouth of the River Sumida. This was the start of the enterprise.

For the first time in 1907, the Government classifying the principal harbors in this country included Tokyo Harbor as one of the principal second class harbors. However, the question of the harbor construction was neglected for some time the only work done during a period of ten years being the improvement of the navigation route on the River Sumida which permitted entry of small-sized vessels.

In September, 1923, the great earthquake disaster occurred in the Kanto district and all overland traffic was suspended. The citizens of Tokyo were compelled to use water transportation. Consequently, the port was overflowed with many vessels carrying relief and other goods causing much inconvenience because of the inadequate landing facilities and shallow waters where many vessels found their bottoms grazing the sea bed.

Some years ago, the Government adopted the Tokyo reconstruction plan and at that time harbor improvement and dredging of the Keihin Canal at national expense were also discussed. The above suggestion at one time reached the Harbor Investigating Committee, but, as it required considerable expense, the plan was shelved.



The Y.15,000,000 Central Wholesale Market, a feature of the Port of Tokyo

Present Pier Built

Immediately after the earthquake, the City hurriedly constructed piers and warehouses as a temporary measure and present pier was completed in 1926. According to the Government's scheme, the City carried out the harbor improving work costing a large sum and on a larger scale than the improving work at the mouth of the River Sumida.

The work was considered to be on a large scale with an estimated cost of Y.33,000,000 extending over ten years. The Bill was passed by the Municipal Assembly in December, 1930, and work was started from November, 1931. At present the work is progressing very favorably and the improving work at the mouth of the River Sumida was completed in March, 1934.

As already mentioned, Tokyo Harbor has shown remarkable progress since the commencement of the work. In respect to both imports and exports it far surpasses that of Yokohama and the amount of goods landing in Tokyo Harbor is rapidly increasing year by year. In 1927, the number of vessels arriving at the port was 1,654, with goods totaling 2,310,000 tons and their total value was estimated about Y.1,830,000,000. In 1937, excluding the number of vessels and cargo under the management of the military authorities in connection with the Sino-Japanese hostilities increased to 3,755, the total amount of goods to 6,760,000 tons and the value Y.860,000,000.

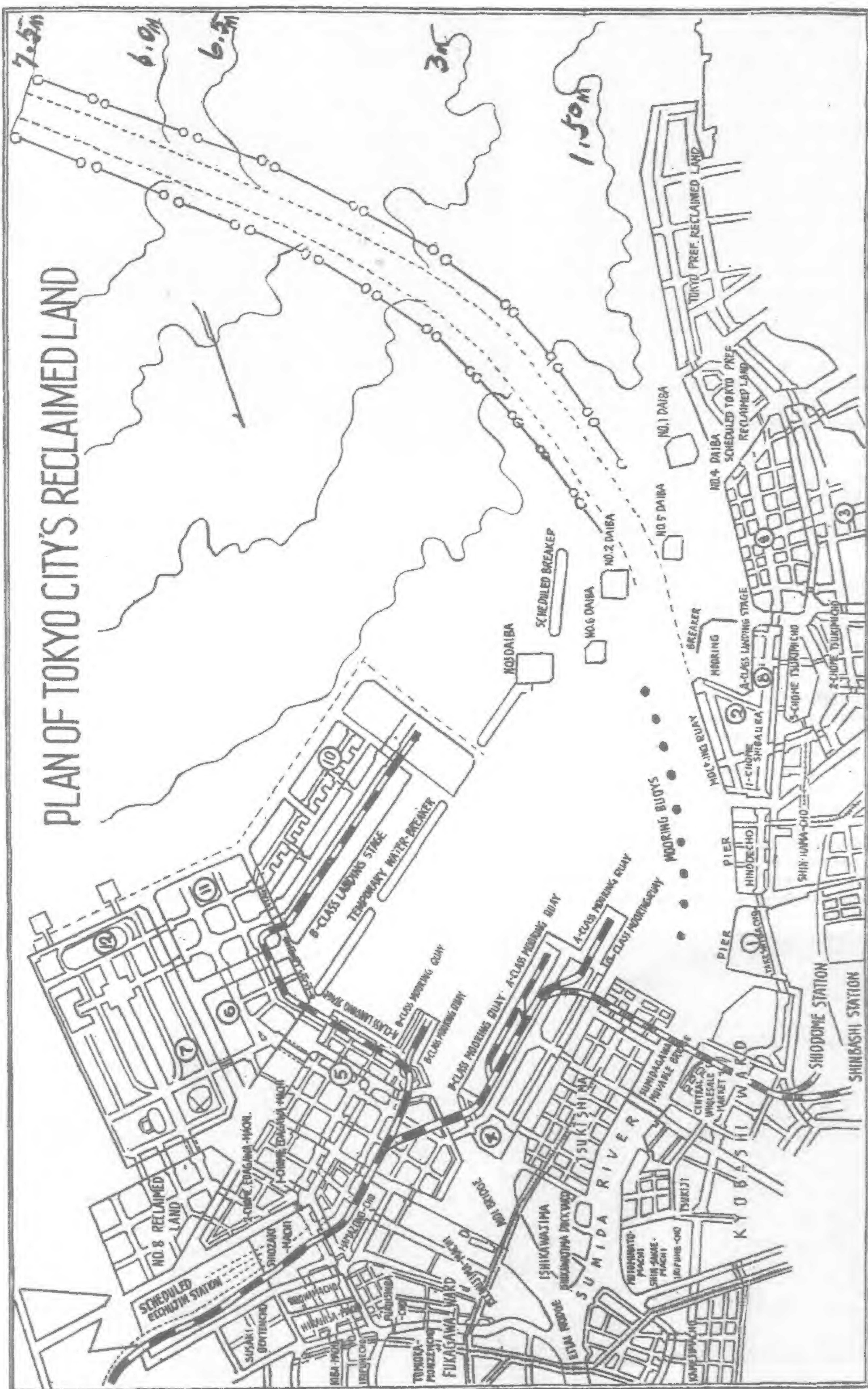
A general survey of the yearly imports and exports since opening of the pier, shows an average increase in arrivals of 210 and yearly increase in tonnage of goods both imports and exports of some 450,000 tons. The above figures show that Tokyo Harbor has developed remarkably since the commencement of the ten year



On the waterfront of Tokyo harbor

*In the Japan Times

Under the circumstances, it is quite natural that Tokyo should be seeking an import and export trading harbor within the city area.



With respect to the amount of imports and transportation of goods to Tokyo from Yokohama, it amounted to 2,640,000 tons in 1936 with exports 590,000 tons, totalling 3,230,000 tons. In addition to these figures, a considerable amount of dry goods was exported from Tokyo to Kwantung Province, China and Hongkong through Kobe, Osaka and other ports.

This method of shipping goods produced in the Tokyo area is causing considerable damage, loss in weight, extra unnecessary charges and loss of time. In order to give a clearer idea about transportation, please note the fact that Y.3,500,000 yearly are wasted in transportation charges between Yokohama and Tokyo on imported goods amounting to 3,230,000 tons.

As above stated, damages and unnecessary transportation charges of goods cause unnecessary high cost of merchandise, the result of which is that not only are the citizens of Tokyo compelled to pay more for their goods but such methods are affecting the general industry. As to the delay in delivery and loss of time, according to the classification of merchandise and season, statistics are not available but ordinarily it requires from one to two weeks delay.

The above shows a definite and unjustifiable delay in business transaction, loss of interest on investments and makes it disadvantageous to get banking facilities for such merchandising.

Now is the time to cut the consumption of liquid fuel. The amount of the goods brought to Tokyo via Yokohama was estimated at 620,000 tons per day in 1936 by motor transportation alone. To convey these goods from Yokohama to Tokyo required more than 800 trucks per day. The total number of trucks used in transporting goods between the two cities is estimated at 1,200. If these trucks were replaced by water transportation, it would result in economizing fuel and also ease the heavy volume of traffic on the highway between Yokohama and Tokyo.

Commensurate with the recent development of this country, the demand for our merchandise in various foreign countries has expanded, especially in Manchoukuo and China.

There is no doubt that in future this tendency will increase with the development of the two countries. On the other hand, it is quite clear that along with the industrial development of Tokyo, the time will arrive when various raw materials will have to be imported from the two countries.



Completed wharves and warehouses, Tokyo harbor

Under the above stated circumstances, it is now high time to open Tokyo Harbor to international traffic. We sincerely hope that Tokyo will undertake industrial development and at the same time promote the welfare of its citizens, together with the realization of the national policy for the exploitation of Manchoukuo and China.

No Fear for Yokohama

Mr. Tadao Yamada, Yokohama Harbor Master, said, in an article appearing in the *Japan Times* that talk of developing the Tokyo port had aroused considerable uneasiness in Yokohama because there exists the fear that the prestige of the Yokohama harbor is at stake and that Tokyo will assume the position now held by Yokohama as the "Gate Way" to Japan. However, Mr. Yamada wrote, these fears are non-existent and it is difficult for "me to understand why Yokohama should fear competition from Tokyo." Mr. Yamada further wrote:

The position held by Yokohama is known throughout the world. Even before the 1923 Earthquake, this harbor was a modern one and with its destruction, the Yokohama, Kanagawa and National Government renewed their efforts to rebuild as rapidly as possible and at the same time make improvements that were merely paper plans previously. To-day, this port can well be pointed to with pride.

Yokohama Harbor can and does accommodate ships of all sizes with the exception of the *Normandie* and the *Queen Mary*. But there are but few ports in other countries that could handle such enormous ships. In the harbor, well protected by break-waters are buoys where freighters may lie at anchor while discharging and taking on cargo. Then there are sufficient drydocks and shipyards either to repair, overhaul or to build ships. The facilities offered by this port are numerous that even should Tokyo attempt to gain prestige over Yokohama, it would be impossible to accomplish this for years to come. The main obstacle being the enormous expense that would be required.

A good harbor would be useless unless it were possible to transport cargo and freight efficiently and cheaply. Yokohama enjoys not only excellent rail service but good roads as well. And at present there is a super-highway under construction while another one is being considered to link Tokyo and Yokohama and the factory



View of wharf looking north, Tokyo harbor

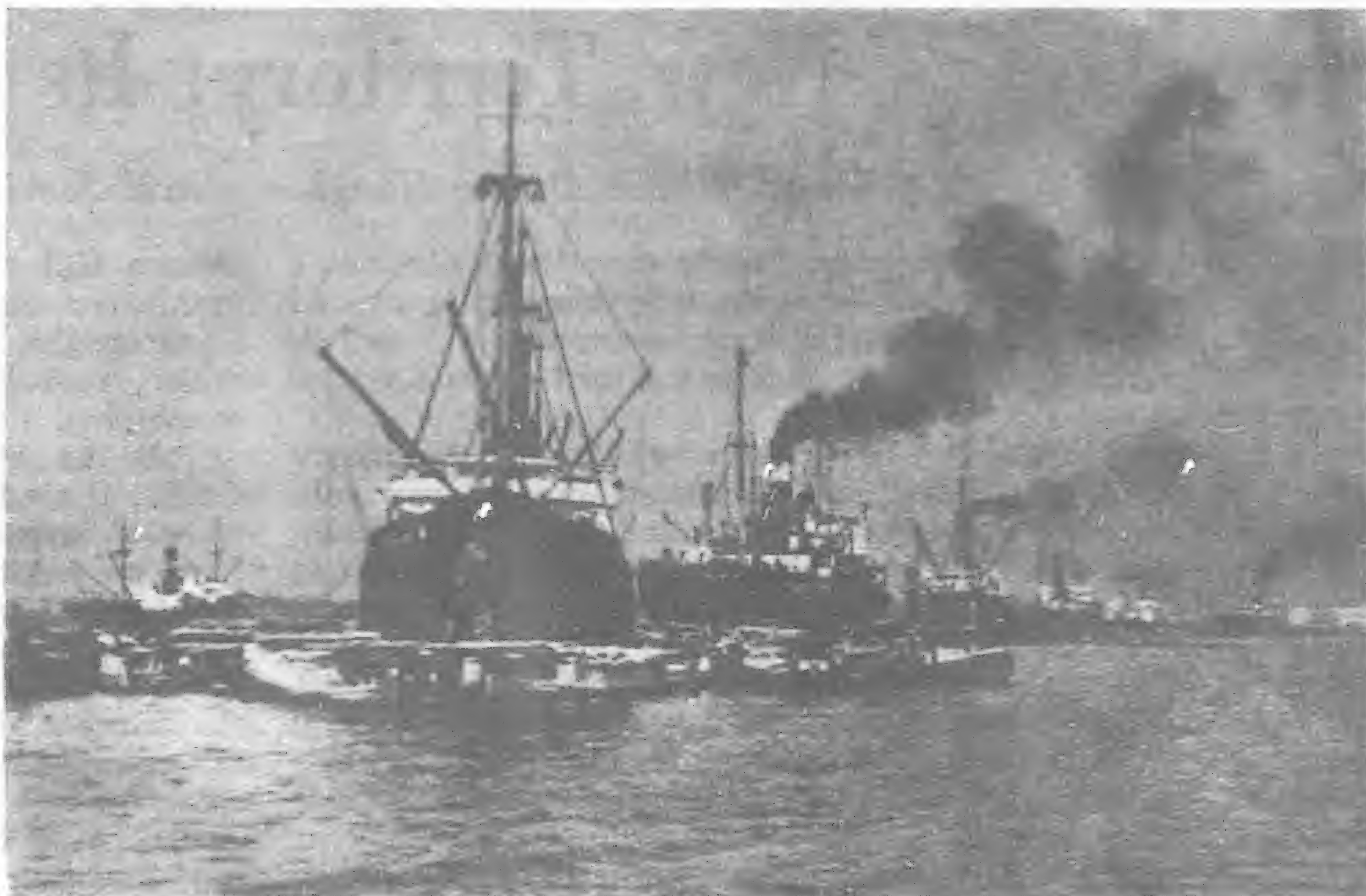
centers between the two cities. Within a short distance from Yokohama are busy industrial centers, and plans are under way to improve the harbor near Tsurumi.

While I have the greatest admiration for the rapid improvement and development made by the Port of Tokyo, I believe that there is still much to be done before it can think of competing with this harbor. At present, only ships between 6,000 and 9,000 tons can navigate the lanes leading to Tokyo, while ships of 10,000 tons can go as far as Kawasaki. Many ships of foreign registry go to Tokyo but only with the special permission of the Customs. This is done because the cargo carried applies specially to Tokyo and its immediate surroundings. Even the combination of Tokyo and Kawasaki cannot compete with Yokohama until their respective harbors are greatly improved.

In Distant Future

If Tokyo plans to build a bigger and better port than Yokohama, the following points must be given serious consideration; first of all the cost of opening a shipping lane big enough to allow big ships to navigate safely and freely would be a very costly enterprise; then drydocks and shipyards must be built to repair, overhaul or build new ships, and this would be waste of money because such facilities already exist in Yokohama. This spending program would be wasteful and would not bring the desired results, so I do not believe that in the near future at least, such ambitious plans can be undertaken.

While the advantages enjoyed by Yokohama Harbor are quite obvious, it seems that there are many people here who are worried about the increased small shipping that is going to Tokyo. This can be blamed on the fact that the municipality built big and modern wharves and piers most of which are now lying idle because the ships formerly docking there are now going directly to Tokyo.



Vessels moored at buoys in Tokyo harbor

But these worries and fears are purely local and do not greatly affect the position and the prestige of the harbor. So it is my sincere belief that there is not the slightest need to worry or fear that Tokyo will take the position now held by the Port of Yokohama.

To-day there seems to be much rivalry between the two cities but I believe that in the future it will cease. Tsurumi and Kawasaki are developing and building their harbors and because many of the important industries are located there it seems to me that gradually Yokohama Harbor will move north while the Harbor at Tokyo will move downwards toward these centers. When that time arrives, there will be neither a Yokohama nor a Tokyo harbor, for they will be combined into one big port.

New "Caterpillar" Diesel Auto Patrol

A HEAVY-DUTY, self propelled road grader, the Diesel No. 12 Auto Patrol, has been announced by Caterpillar Tractor Co.

Designed for efficient and economical road building as well as road maintenance work, the new machine has a range of useful blade positions surpassing even the modern blade grader. In addition to high or low bank cutting positions, the blade can be turned completely around on the full revolving circle. With ample clearance both front and rear, the blade is thus positioned for working in reverse gear. This feature will be valuable for sub-grade work, shaping bad spots, working short stretches or where turning is difficult.

With the blade mounted in the center position on the blade beams, the new Auto Patrol permits a correct ditching position on either side, with the toe of the 12-foot blade directly behind the front ditch wheel, and ample clearance to prevent clogging.

A six-cylinder "Caterpillar" Diesel Engine delivers 66 brake horse-power, and is

mounted over the driving axle to best utilize its weight in preventing wheel slippage. A gasoline starting engine insures easy starting regardless of atmospheric temperatures.

The transmission offers six forward speeds and two reverse. A low speed of 1.8 m.p.h. provides maximum pull for the heaviest jobs, and slow speed for fine grading. Second speed is 2.8 m.p.h., permitting faster operation on most ditching and other heavy work. Four higher speeds of 4.3, 6.8, 9.6 and 15.2 m.p.h. give ample speed range for road mix, snow removal, travel, etc. Reverse speeds are 2.4 and 3.8 m.p.h.

The Diesel No. 12 Auto Patrol is equipped with two speed mechanical power controls. A simple shift of a lever in the gear box gives faster control for the longer blade movements on coarse work. For close finishing work, requiring extreme accuracy in blade settings, the slower control is quickly available.

The new Auto Patrol is offered with tandem drive and leaning front wheels as standard equipment,



"Caterpillar" No. 12 Auto Patrol

Hongkong's New Territory: Its Beauty and Interest

By W. SCHOFIELD, the Hongkong Civil Service. in *Asiatic Review*

THIS article does not pretend to do more than point out a few of the beautiful and interesting things to be seen in the little corner of South China known as the New Territory of Hongkong: to do them full justice would require a volume.

A glance at the map on this page shows what the New Territory is: a land of hills, islands, and fiords forming part of the mountain chain which occupies the coast of South-East China, and offering in every direction views of mountain, sea, and plain of the greatest diversity and beauty, to which two thousand years of history and tradition give human interest; for not only is there the interest natural to Westerners in the oldest theater of European oversea enterprise in China, but the interest of Chinese cultural and political expansion southwards, and, I can now add, that of the remains of pre-Chinese tribes and cultures known to have existed in and near Hongkong.

Let us suppose that we have taken a car from the Star Ferry, Kowloon, opposite Hongkong. We reach the beginnings of the New Territory close to Prince Edward Road, where the first signs of Chinese cultivation appear. Much of the land is raised in level for building; this is cultivated on permits from Government subject to payment of fees: the area not raised is held on 75-year Crown leases. South of the Kowloon range, which here rises directly in front of us, little rice is grown; market gardening and flower growing are the rule, and the wet fields produce the "Portuguese vegetable," or watercress—a larger and coarser plant than ours. Along the coast lie a number of ship-building yards, which turn out not only junks but launches, and even repair small steamers; the sloping beach of Ch'eungshawan (Long Sand Bay), sheltered from the south-west wind by Stonecutters Island, and near enough to Hongkong to get raw materials easily, has fixed the industry there; besides, land purchase, impossible to such under-capitalized firms, was needless, as they got their areas on yearly permits.

At Ch'eungshawan the road divides: the right road goes to Taipo and the center of the Territory, the left to Castle Peak and the west. Taking the Taipo road, we begin to climb the foothills of the Kowloon range. The west end of the range is, as every cutting shows, of granite, which is believed to have reached its present position about the time that the English chalk was being deposited. It then lay deep underground, forming a low dome of irregular shape, and cooled and solidified very slowly, so that its crystals grew large. Near the top and edge of the mass it cooled faster, so the crystals were smaller and the rock became harder. As the rocks above the granite wore away in the course of ages, the granite was exposed, and decayed. The coarser rock rotted faster than the finer, which was strengthened by the edges of the disappearing "roof" rock beside and above it. This roof rock still exists on Kowloon Peak and Tate's Cairn, away to the east;

Beacon Hill and Lion Rock retain some of the finer-grained granite on their summits, while the remarkable Lion's Head Rock on the latter, and the Amah and Child Rock in Shat'in valley, probably owe their shapes to accidents of joining and weathering.

As the granite does not decay uniformly, but chiefly along cracks, the undecayed rock between them remains as boulders, often of immense size, when the softened rock round them has been washed away by rain. This is happening all over South China, and is proof of the former existence of vast jungles, which alone could have prevented the washing away of decayed rock. When man cleared off the jungle, this protection disappeared, and the frequent masses of boulders and areas of bare rock-surface on the granite hills testify to enormous soil destruction.

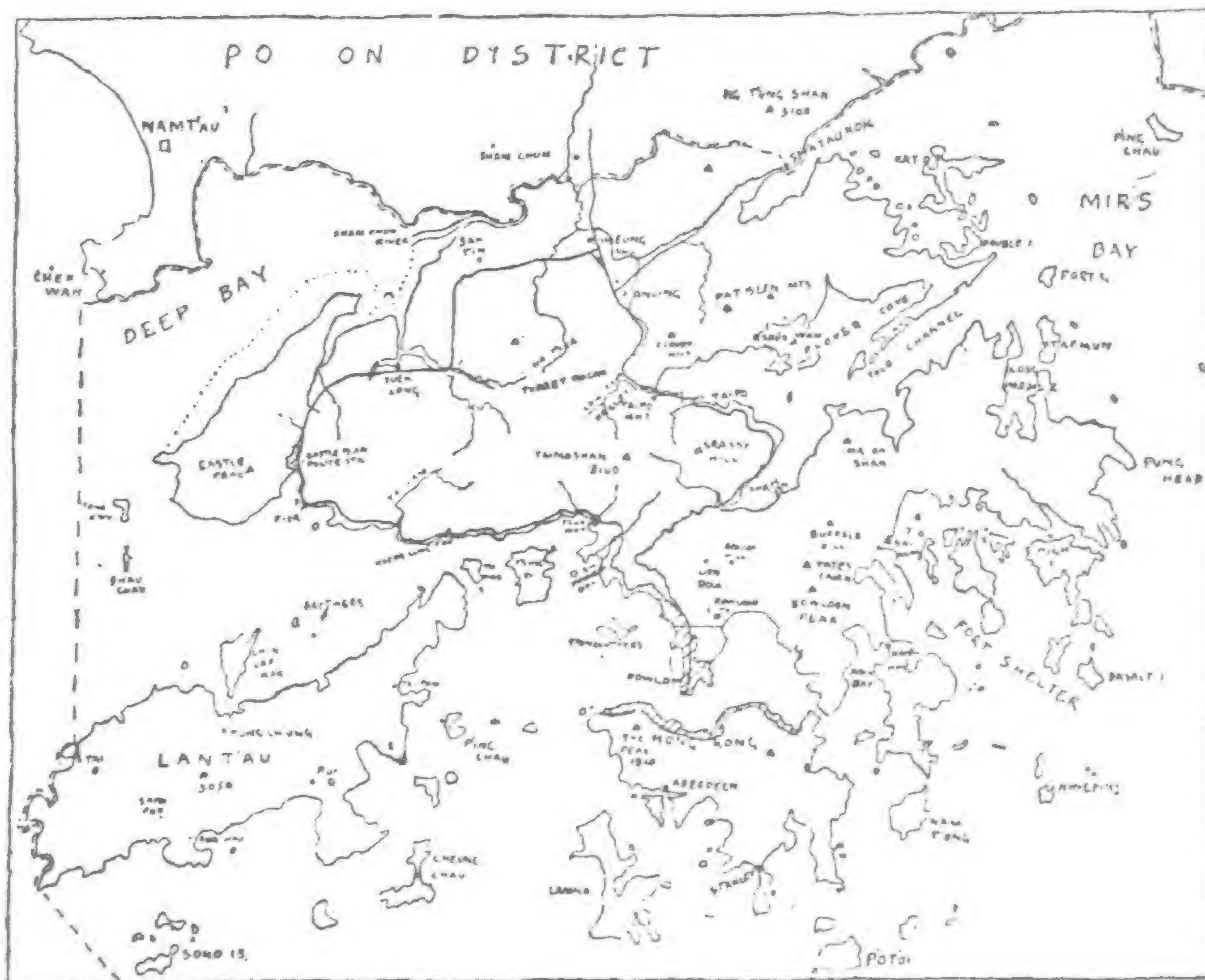
Down to the Sea

After passing Kowloon reservoir, an artificial lake set amid

pine-woods and fringed with long bays and headlands, the car enters Shat'in valley and runs downhill to sea level. This valley, where between March and October the earth is carpeted with the vivid green of flooded rice-fields—rice is the chief crop of the New Territory—is an arm of the sea, which flooded it at the time of the great sinking of the Pacific coast, and is now receding slowly before the sand and gravel from the two mountain masses on either side. These have formed the "sand fields" which give the valley its name. It is a corner of the fiord called Taipo, or Tolo, Harbor. Across it can be seen Turret Hill, the Buffalo Peaks, and, finest of all, the 2,200-foot Ma On Shan or "Saddle Mountain" from its shape; its steep ridges and vast

precipices make it one of the most striking mountains in the Territory: its base is of granite, its upper half of the tough lavas and ashes which form most of the highest mountains in the Colony. Among these are found many fragments of the still older sandstones, shales, and cherts which alone offer fossil-hunters a chance of success in Hongkong. Here, too, is the only commercially workable iron ore in the Colony; a steep road leads up to the mine from sea-level, and piles of the ore lie by a small jetty. From the summit can be seen wonderful views of mountains, islands, and straits, while on the slopes the botanist can find rare and interesting plants, though they will cost him a hard climb.

Shortly before reaching the sea we cross the diminished waters of the Shing Moon river, blocked three miles upstream by the highest dam in the Empire to furnish water to Hongkong, completed in 1937. On a hill north of the river is the unique Mission to Buddhists called Tao Fong Shan, with its beautiful church in Chinese style, roofed with tiles of the same glorious blue as those of the Temple of Heaven; its font is a lotus-shaped bowl surmounted



Sketch Map of Hongkong and the New Territory

 Built-up areas

by the Cross, and on its wall hangs a rubbing of the great Christian inscription of Si-an.

For three miles the road keeps at sea-level beside the railway. Under the hills across the valley lies a most interesting walled village, with towers, loopholes for rifles, and gateway all complete, and all quite modern, put up only ten years or so before the Territory was leased to Britain. This walling, a common expedient in former years, is chiefly practised by the Cantonese-speaking settlers who in the Sung dynasty moved into the plains and valleys and were the first Chinese to populate the coastlands in large numbers. A walled and moated village is a most picturesque feature of the countryside, especially if within it there rises a tall tower, reminding the Westerner of a donjon keep, with narrow barred openings for windows and a battlement atop. This structure is simply the local pawnshop, where the countryside raises its capital and keeps its winter coats or its summer silks, according to season, as collateral. One such shop can be seen at the village of Taipo T'au, at the head of the Taipo valley.

The road now recrosses the railway and rises to nearly 300 feet. At the top of this rise it leaves the granite for the first time and runs on to sedimentary rocks forming part of the "roof" covering the great Taimoshan igneous mass. A new arm of the fiord opens to our right: it stretches from the mouth of Shat'in cove eastward to Mirs Bay, beyond which, framed by the mountains and headlands on each side, is caught a glimpse of the shore of China. To south are the mountains surrounding Long Harbor and dividing Tolo Channel from Port Shelter; to north is a long ridge forming a peninsula which partly encloses the lovely inlet of Plover Cove. Above the cove rise the Pat Seen hills, another igneous mass, on the western half of which can be seen layers of sandstone, forming its roof and capping the hills. In the very middle of the harbor, Center Islet is noteworthy for its grass, which is always green no matter how dry the weather may be, thanks to the composition of its soil.

Taipo, the name originally applied to the plain at the head of the western branch of the harbor, is now that of the railway station 2,000 yards east of Taipo Market, the economic center of the country bordering the harbor, and the administrative center of the northern district of the New Territory. Much of the market town is new, built on a reclamation made in 1912. The river beside it can float junks, which cross the shallows at high water to load and unload by the market: but launches and small steamers can only reach Taipo pier, for the river, which comes out of the Lam Ts'ün valley a mile west of the market, has filled the head of the harbor with sand for a mile out from shore. It has a remarkable course; it rises on the north flank of Taimoshan, is joined by a stream on its left coming from the pass at the head of the valley, and enters the broad lower half of the Lam Ts'ün valley. This is floored by sandstone, with the Taimoshan mass to south and the Turret Rock mass to north, so that it must be an old valley created by the raising of these two great domes of rock. Just below the road, near the ancient three-span stone bridge, the river turns from north-east to south-east, cuts through the low hills, and enters Taipo plain and harbor. But there is ample evidence that in former ages the river went straight on north-east and turned north to Fanling, joining the Shamchun river, which forms the boundary of the New Territory. The Taipo stream must have been a little torrent like those near Shün Wan, across the harbor; but it cut backwards through the hills and "beheaded" the old stream, drawing off its water and finally deepening its bed 60 or 70 feet almost up to its source. The old bed survives as terraces both in the middle of the valley and on each side, and the whole thing is as clear as a

model. It can be seen by walking 20 or 30 yards up the low bank west of the road at Wai T'au.

This spot has another interest. In the banks and cuttings beside the road are found fragments of the high-fired pottery, ornamented with criss-cross patterns of raised lines, and "double F" patterns of impressed lines, used by the Bronze Age people before the Han dynasty. It lies about two feet below the surface, so evidently soil has crept downhill in the course of ages and buried it, aided by the normal process of soil circulation carried on by termites and burrowing insects. Evidently there was a clearing and a settlement here, 60 feet above the stream, in the broad valley which it had abandoned.

The road now bends north between Turret Rock and Cloudy Hill, past Tsui Hang village, where in 1912 a large hoard of coins dating to the Southern Sung dynasty—about A.D. 1100 to 1250—was dug up under a house; evidently buried about the time of the Mongol invasion in A.D. 1240.

Passing into the Fanling plain, lower hills and wider expanses of verdant rice-fields, stretching away to the border and beyond, meet the eye. These hills are often of sedimentary rock, usually sandstone and shale altered by earth movements and mountain-building into quartzite and mica-schist. These, broken up by an infinity of planes of movement, weather into masses of loose rubble on the steeper hills, held together only by shrubs and coarse grass;



The shore by Taipo market, looking east, Saddle Mountain in the distance

in 1912 the broken-up white quartzite so littered the Fanling golf course that it was most difficult to find a ball among the fragments, and caddies drove a thriving trade in lost balls!

This northern plain is a comparatively dry area; for this reason we see a new crop, the sugar-cane, growing everywhere: it is almost entirely confined to this part of the Territory.

The road passes by Fanling (dusty ridge), noted for its lichee orchard, and near Sheung Shui (upper water), where the new road to Canton branches off. Not far from the junction there are signs that a porcelain kiln once existed there, probably 300 to 500 years ago. To left, between the mountains and the road, lie the rolling parkland and forests which Government and the Golf Club have created out of rice-field and hill to make the finest golf course in the Far East. To south-west of it lies the low pass called Ha Ts'ia Gap, from the village below it, whose name means "lower slope"; its top is hardly 100 feet above the general level of the plain, though the hills each side rise over 1,800 feet.

Beyond San T'in (new fields) there stretches the wide plain bordered by the largest tidal marsh in the Colony, beyond which again are the waters of the strangely named Deep Bay: it certainly is a deep recess of the coastline, but is quite the shallowest arm of the sea in the Colony's waters. Mangrove bushes, sometimes six feet high, cover the flats, which are the resort of numerous wild



North end of Lam Ts'un Valley, showing Shamchun River Terrace and steep slope of Central Terrace in foreground: in the distance One Tree Pass on Cloudy Hill



Prehistoric site of So Kon Wat, looking south; motor road in the middle distance: West Brother and Lant'au in background

duck and other waterfowl, and offer first-rate shooting. Beyond, the low neck of sand on which Namt'au stands can be seen, joining to the mainland the rocky headland on which is the great Buddhist temple of Ch'ekwan (red bay). The shores of Deep Bay are parcelled out into oyster beds; their owners, living in Chinese territory, pay fees to the British district officer, whose jurisdiction extends to high-water mark as far as a rocky point near Ch'ekwan.

The Pirate Menace

Namt'au is the capital of the district of San On, or Po On, which used to include Hongkong and the New Territory, and was set up in 1560 to deal with the pirate menace, particularly from the Japanese. Previously the area had been a portion of the Tungkwun district, which lies to the north.

The road now runs south to the rich plain of the Pat Heung (eight villages), the home of the Tang family, the leading clan of the New Territory, and the chief landowners in the countryside, with a history going back to the Sung dynasty. Above it, on the slope of Taimoshan, is the Ling Wan monastery. The villages are walled and moated; one has a very handsome pair of iron gates. The streams flowing into Deep Bay here have sufficient water to make them good harbors for junk traffic, so that in the next stretch of plain, where the road runs west again, we find a large country town, Yuen Long, with a regular junk trade; it is also a bus route terminus, and the chief market town of the north-western New Territory: the abundant water in the hill streams and the flatness of the plain make this the richest agricultural area in the Colony, and a special Land Office has been put up on a hill near by, at P'ingshan, to deal with its land business.

Once past P'ingshan the car has in front a range of hills, low and mainly of sedimentary rock on the right, higher and of granite on the left, culminating in the lofty hill Castle Peak, or Ts'eng Shan (green mountain), a center of Buddhist legend, with a monastery 700 feet up its east face. It is mentioned as Mount T'ün Moon in the account of the travels of the monk I-ching, who touched at Canton on his way back from India in A.D. 695. T'ün Moon is still the name of the district at the foot of the hill, where once there was a Chinese coastguard station: the name means "garrison gate" or "channel"; the deep-water channel to Canton passes beside the hill. There are three peaks on the hill, which has a form as distinctive as Saddle Mountain. The name "green mountain" comes from the fresh green grass on its eastern slope, where the soil is of sedimentary rocks instead of barren granite. Wolframite has been mined in the Castle Peak range, and the 20-year-old adits are still visible.

To left of the road, along the foothills near the police station, many polished stone adzes of prehistoric times have been found, proving the valley contained settlements. The pottery found with them is of ancient type. One settlement was, however, of historic

date, for the pottery is of types found in Canton and dated to the Han dynasty, and no adzes are associated with it: this may possibly be a relic of the ancient garrison.

By the village of San Hui (new market) we reach the sea shore again, and running off the sandstones and shales of the valley, enter granite country. Here begins the series of bathing beaches that make the next length of road a combination of the Lido and the Corniche. Just off shore is the sea route to Canton; and beyond it, displaying its full length and its lofty peaks, lies Lant'au, largest of all the Colony's many islands. In the west can be seen the three peaks and three isthmuses of the curiously shaped Shau Chau (guard-station island); in front of Lant'au, the East and West Brothers, known to the Chinese as the Little and Great Whetstones; and Ch'ek Lap Kok—Chulukok of the charts—which creates the harbor of Tung Ch'ung, the former administrative and military center of Lant'au; a large island, but very thinly inhabited.

A little beyond the branch road to the pier we pass another fine bathing beach, behind which is a gravel cliff cut away by a stream: two feet from the surface are fragments of prehistoric pottery of two types, the soft and the coarse: the latter is decorated with string impressions applied with a bat or roller. This is one of the earlier of our prehistoric sites.

At the next large bay, called So Kon Wat, are a practice range for artillery, two high banks of sand marking the modern and the ancient beach, the latter 250 yards inland from the former, and a noteworthy prehistoric site. The two beaches are among the many proofs to be seen on this coast that the sea level has fallen 10 or 15 feet. This can only have happened a few centuries ago, for dead oysters and corals are still found here and there in sheltered corners a little above high-tide mark. The prehistoric site is on a low hill, partly grass-covered, and has yielded hard and glazed pottery, pieces of quartz and stone rings, centers knocked out in ringmaking, masses of chips, lumps, and flaked discs of quartz, a few partly made cylindrical beads of green stone, and even a bronze arrow-head. All these lie scattered on the surface, or buried at a few inches depth.

This valley, like most other valleys along this stretch of coast, runs north-east and south-west, agreeing with the general structural trend of the country. A little further on, a smaller valley contains a military road. By walking up it the long, beautiful Tai Lam valley is reached. It is, like Castle Peak and Lam Ts'un valleys, formed by the uprising of domes of molten rock, in this case granite, inside the earth's crust each side of it. The result is a long straight valley 100 to 180 feet above sea-level, with a pass at its north-east end no more than 250 feet high, beyond which a steep slope leads down to the plain around Yuen Long. Out of its south-west end flows the river, making two right-angled turns and dropping over two waterfalls before reaching the sea at Tai Lam Ch'ung. The river is thus only just beginning to deepen its valley.

A Prehistoric Site

Crossing its estuary by two long bridges, we climb a hill and round the steep rocky headland of Brothers Point, where loss of soil has left great areas of hillside bare down to the very rock. The next village, Ts'eng Lung T'au (green dragon's head), contains a Government telephone call office, a prehistoric site on a hill shoulder, and boats which can be hired to carry passengers to the island of Ma Wan opposite, or to Lant'au beyond it. The name of this village refers to Chinese geomancy: a hill ridge east of a site with a south-west aspect is a "green dragon," and that to west is a "white tiger." The "head" is the rocky headland to east of the bay. Our "Worms Head" and "Great Ormes Head" belong to very much the same order of ideas.

The next village we reach is Sham Tseng (deep well), where the Hongkong Brewery and Pure Cane Molasses Co. are established. Much of their land has been acquired from the villagers, not by purchase, but by lease, rent being paid regularly, thus giving the peasants an income instead of a lump sum, which might be squandered, stolen, or lost, and avoiding the trouble caused by some local Naboth refusing to give up the inheritance of his fathers.

Just before reaching the next village, Ting Kau, we leave the granite and enter the south-west corner of the Taimoshan igneous mass. The road runs alongside the strait between Ts'ing Yi island and the mainland; this strait is another valley of the same type as those described earlier, floored by sediments and flanked by upraised igneous rocks, for the sediments are exposed at two or three places both on the road and on the island shore.

The deep channels between Ts'ing Yi and the mainland offer good harborage to coasting steamers and tankers, but the innermost bay, Ts'ün Wan, is also named rightly Ts'in Wan (shallow bay). The place so named is a small town, unwalled, with shops and a market, the center of the whole district from the south corner of Gindrinkers Bay to Ts'eng Lung T'au, and inland to the top of Taimoshan. This district, with New Kowloon and a district round Junk Bay, is the mainland portion of the Southern District, under an officer whose office is in Hongkong, the natural center of his district.

One crop very common in the Ts'ün Wan area is seldom seen outside it—namely, the pineapple: it is grown on the steep hill slopes, generally among pine trees, which help to hold the otherwise unprotected soil together; even so, washouts in pineapple patches are not uncommon. For this reason they can only be grown on compact, clayey soil; for the loose gravel of decayed granite would be washed away by the first heavy rains unless terraced. Shing Moon valley, above the reservoir, used to be a center of this kind of cultivation: now the land has been resumed

by Government and the people have moved to other parts of the Territory, and have started growing pineapples near their new homes.

On entering the Ts'ün Wan plain the first noteworthy object we pass is the grave of the ancestor of the Tang family, marked by two octagonal pillars which stand just above the road. The hillside around has been laid out as a garden by the family, and the grave is considered to possess better "fung-shui" than any other in the Colony. Above and below it is a prehistoric site, with both coarse and high-fired pottery, and other objects. Rounding a little hill, we cross a wide stream, and about 300 yards up this is a group of mills worked by waterwheels: these work wooden hammers, which pound clay and sandalwood for making incense sticks; the clay prevents rapid burning when mixed in the right proportion with sandalwood powder. A little further on, near Muk Min Ha (under the cotton-tree) is a big stream which has built up a delta of sand and boulders washed down from Taimoshan, and much of Ts'ün Wan is built on such material.

Hongkong at Twilight

By the police station—such stations are always built near important villages—is a branch road to the famous Shing Moon reservoir, rising through mountain scenery of ever-increasing grandeur and beauty to the valley where it lies, deep in the folds of the Colony's greatest mountains, Taimoshan, Grassy Hill, Needle Hill, and Smugglers Ridge, and soon to become a forest reserve. The main road keeps on to Ha K'wai Ch'ung, the group of villages on Gindrinkers Bay. The hilly peninsula dividing this bay from Ts'ün Wan has unusually red soil, marking, like the soil by Taipo Market, the margin of the Taimoshan igneous mass, which is of different composition from the rest. On its south side is a prehistoric site in a sandbank behind a beach. It is one of the later sites, for a stone mould for casting axes was found there.

The road now climbs the ridge of Laichikok Pass, the lowest point of the Kowloon range. Looking back from near the top, a last view is caught of Hongkong's largest mountain; its whole majestic south flank rises before you, clad below in pinewoods and varied by the square patches of pineapple, above in grass, green in summer, purple-brown in winter; its great flanking ridges east and west rising to lofty heights, and its base planted in the island-studded sea.

The journey is likely to end towards evening. If so, one last spectacle is offered to the traveller: the view of Hongkong and its harbor in the twilight, with the lights rising towards and mingling with the stars—a fitting climax to such a feast of beauty as is worth travelling half round the world to see.

A Letter from Manchoukuo

(Continued from page 419)

is being executed by subsidies from the state. The difference of climate is counted as one of the factors which may hamper immigration of Japanese farmers, but so far the cold dreary winter of Manchuria has proved no obstacle to the permanent residence of the Japanese immigrants. Another important factor is the difficulty of reconciling the Manchus with the Japanese immigrants, but that is gradually disappearing probably owing to the fact that the two races have begun to understand each other through the co-existence of a few years.

New Japanese Ships

The Nagasaki yard of the Mitsubishi Heavy-Industries has announced the receipt of orders involving the construction of two passenger ships for the Nippon Yusen Kaisha and one freighter for the Osaka Shosen Kaisha, according to the Nikkan Kokyo.

Each of the passenger ships will have a gross tonnage of 11,600 length overall of 153 meters, breadth moulded of 25.2 meters and depth of 12.6 meters. Each will have a speed of 20 knots. The keel of one will be laid in January and of the other, in March. Both will be placed on the Australian service.

The Osaka Shosen Kaisha's freighter, to be named the *Brazil Maru*, will be placed on the South American service. It will have a gross tonnage of 13,000, length overall of 155 meters, breadth

moulded of 21 meters and depth of 12.6 meters. Its speed will be 21 knots. Its keel was laid on October 31. The ship will be completed at the end of 1939. It will be a sister ship to the *Argentina Maru*, in course of construction in the same yard.

The number of ships, each weighing more than 1,000 tons gross, in course of construction at the end of October was 125, aggregating 882,510 tons deadweight, according to the *Japan Shipping Exchange* as quoted by *Domei*. The number increased five and the tonnage 1,410 over the month before.

Details:

Shipyards	Nos. of ships	Dw. tonnage (1,000)	Shipyards	Nos. of ships	Dw. tonnage (1,000)
Hakodate	1	5	Osaka Shipbuilding	4	11
Harima	15	108	Mihara	2	2
Kawasaki	9	116	Tama	16	113
Kashojima	11	50	Tsurumi	7	27
Mitsubishi, Nagasaki..	17	202	Urabe	1	2
Mitsubishi, Kobe ..	10	61	Uraga	14	52
Mitsubishi, Yokohama	10	81	Mukojima	1	2
Namura	2	4			
Nakada	—	—	Total	125	882
Osaka Iron	4	36			

The Chosen Heavy Industry Company, in Korea, has received orders for the construction of three ships, reports the Nikkan Kogyo. A 1,500-ton ship will be built to the order of the Chosen Yusen Kaisha and two others, each 600 tons, for Tateishi and Company, Japan. These ships are expected to be completed in the course of next year.

The Japanese Iron and Steel Industry

Review By United States Tariff Commission

THE United States Tariff Commission have recently issued Report No. 128, "Iron and Steel," being a survey of the iron and steel industries and international trade of the principal producing and trading countries, with particular reference to factors essential to tariff considerations. Among the countries whose steel activities come under review is Japan, considerable space being allotted to a review of her iron and steel industry. Although the statistical matter is necessarily not up to date in a publication requiring considerable time in its compilation and issue, the general facts relating to the industry are usefully summarized, and we give the following extracts.

The rapid development of the Japanese iron and steel industry in recent years has materially changed the character of the country's dependence on imports of both steel products and materials used in steel-making. In recent years imports of steel-making materials have greatly increased, and Japan is now the world's largest importer of pig-iron and of iron and steel scrap. The rapid industrialization of the country has created a large demand for semi-finished and finished material, and marked changes have occurred in the demand for particular products. Since 1929, the part of this demand, particularly for finished steel, supplied by imports has tended to diminish as the domestic industry increased its productive capacity. Imports of semi-finished steel, however, have increased. In recent years exports of finished steel have exceeded imports, some finished products having entered into competition with those of the older exporting countries, especially in Far Eastern markets. The extraordinary demand for steel and steel-making materials in Japan during the period 1936-38, created in large part by military and naval activities, gave an unprecedented stimulus to both domestic production and importation, but tended to limit exports.

Iron Ore and Coal

Since the reserves of good quality iron ore are limited, much attention has been given in Japan to the development of methods for utilizing very low-grade ores and iron sands, the reserves of which are believed to be large. Efforts to utilize the iron sands have not been commercially successful so far, but the Government is constantly making special efforts, by means of subsidies and other financial aids, to encourage further utilization. The output of sponge iron, a form of iron derived in Japan from the iron sand, is small, having amounted to only 5,000 tons in 1935. The obstacles to large-scale production are many, the principal of which is the presence of impurities, such as sulphur and titanium compounds, in these sands. Arrangements have recently been made for the use of a patent Krupp direct-reduction process to exploit these iron sands and low-grade ores. However, only if the ordinary supplies of ore and pig-iron are cut off, or if exceptionally high prices prevail for steel, is it likely that these iron sands can be exploited at all economically.

The production of iron ore in the Japanese Empire has not increased in recent years as rapidly as consumption. The output in Japan proper increased from about 175,000 tons in 1929 to 500,000 tons in 1935, whereas the colonial output (exclusively Korean) increased only slightly—from 543,000 tons to 589,000 tons.

Prior to the World War, Japan obtained well over 90 per cent of her imports of iron ore from China. Since then, particularly since 1925 when the export of iron ore from China sharply declined, British Malaya has been increasingly important as a source of supply and in recent years has been the leading source. In 1936 Malayan iron ore accounted for 45 per cent of imports from abroad into Japan proper, while Chinese ore accounted for 33 per cent. Most of the remainder was obtained from the Philippines and Australia.

The larger iron mines in Malaya are leased and controlled by Japanese financial interests. Practically the whole of the output is exported to Japan; such exports amounted to nearly 1.5 million tons in 1935, a quantity considerably in excess of the production in the Japanese Empire or about equal to that of Manchuria in the same year. Iron mines in the Unfederated State of Johore

are controlled by Japanese interests through long-term leases obtained from the local Sultan. The Johore mines supplied practically all the ore exported from British Malaya to Japan up to 1935. Since 1935 the Japan Mining Company, Limited, has developed mines in Trengganu which now surpass in output the Johore mines. Japanese companies are acquiring new properties and options in Johore, Trengganu, and Kelantan with the intention of increasing the output of the Malayan mines very considerably in each of the next few years.

The Malayan ores are high-grade (about 60 per cent iron) and labor costs are low, but suitable grades of metallurgical coal for developing a Malayan steel industry are lacking. As the ships carrying ore from Malaya return with coal cargoes, transportation costs are not borne by the ore alone. At present there are no great obstacles to the exploitation of these Malayan iron-ore resources by Japanese interests. The British have not attempted to divert these ores for conversion within the British Empire; there are large reserves of iron ore much closer to the industries of the United Kingdom, India, Australia and South Africa.

Australia was becoming another important supplier of iron ore to Japan. The Japan Mining Company, which has large interest in Malaya, entered into an arrangement with a London interest to operate the rich (68 per cent iron content) ore on Koolan Island situated on Yampi Sound in Western Australia. The plan was to produce a million tons of iron ore annually for the decade beginning with 1940, operations to start in 1938; but the Australian Government announced a prohibition on the export of iron ore after July 1, 1938.

The Philippines also have recently become an important supplier of iron ore to Japan, the ores now being exploited being said to contain 60 to 65 per cent iron.

Although the Japanese Empire is well supplied with coal for fuel and power, the reserves of coking coal are limited, considerable quantities of coking coal are imported. Just what part of the imported coal is of coking quality is impossible to say, but it is certainly much the smaller part. The imported coking coal comes largely from the Kaiping mines in North China, operated by the Kailan Mining Administration, an Anglo-Belgian interest. This Chinese coal when mixed with Japanese coal in a ratio of one to four produces a satisfactory metallurgical coke.

Early Developments in Steel Industry

The development of the iron and steel industry in Japan is indicative of the rapid industrialization of that country since the Sino-Japanese War (1894-95). Progress was steady from the opening of the World War until 1930; since the decline in 1931 it has been particularly rapid. Steel-ingot production was 20 times as great in 1936 as in 1913 and twice as great as in 1929. With self-sufficiency as the national objective, the Japanese Government has from the outset nurtured the iron and steel industry. The first effort of the Government to establish a smelting industry in 1874 was abortive. But after the war with China (1894-95) the need for heavy industry to support modern armament was realized. In 1896 the Diet authorized the establishment of the Imperial Steel Works (Seitetsuju) at Yawata, on the island of Kyushu. In 1901, when operations at the works began, annual steel capacity was 90,000 tons. This plant, now greatly expanded, remains the largest single producer in Japan.

The Yawata Works proved to be such a national asset that during the Russo-Japanese War (1904-5) plans were projected for further expansion. By 1909 the annual capacity of the works had been increased to 180,000 tons of steel, the principal products having been structural shapes, bars, plates, rails and wire. Prior to the World War there was some private effort to produce pig-iron and steel. Japanese financial interests, however, were generally reluctant to invest in the industry. The World War furnished a new impetus to expansion. With foreign embargoes on steel exports, supplies for the Japanese industry from abroad were cut off entirely or drastically limited. This situation had a profound

influence on the nation, convincing it that a strong domestic industry should be developed. By the end of the War many private enterprises were active, accounting for 62 per cent of Japan's output of pig-iron and 43 per cent of its steel.

Following the period of wartime prosperity came the depression of 1920 in the steel industry with a collapse of prices. Failures of some private concerns forced reorganization and led to Government absorption. The concern of the Government for the future of the industry manifested itself in various aids and subsidies. Steel production thereafter steadily increased except in the depression years 1931-32. The movement toward consolidation under Government direction strengthened with the outbreak of hostilities in Manchuria in late 1931, a turn of events from which the latest and greatest expansion of the Japanese steel industry dates.

Organization and Control

Since 1920 the production of pig-iron in Japan has been more nearly a monopoly of official or semi-official enterprises than has the production of steel. During the period 1918-34 from two-thirds to three-fourths of the output of pig-iron, exclusive of colonial production, came from plants owned or operated by the Government. An important share (45 per cent in 1931) of the output of steel ingots also was supplied by the Yawata Works. Efforts had been made prior to 1934 to consolidate all processes of production, including pig-iron and steel manufacturing, into a single official trust. This movement was greatly stimulated by the Manchurian and Shanghai hostilities of 1931-32, and by the formation of the semi-official trust known as the Japan Steel Manufacturing Company (Nippon Seitetsu) which, authorized by the Diet in 1933, was established by Imperial Ordinance in 1934.

Nippon Seitetsu was capitalized at approximately ¥360 million of which ¥284 million represented the valuation placed upon the assets of the Government works at Yawata. Its original productive capacity has been considerably expanded by the absorption of private enterprises and by the enlargement of its own plants, so that in 1936 it accounted for over 90 per cent of the total output of pig-iron and for 50 per cent of the entire steel-ingot output of the Japanese Empire. The Government controls 80 per cent of the stock of this company, and has the power to appoint the president and to approve nominations to the board of directors. By virtue of the obligation, taken over from the Government works at Yawata, to provide 1.5 million metric tons of pig-iron annually for the use of the military and naval services, the military and naval ministries are in a position to influence the production policy. The company, moreover, has the privilege of borrowing Government funds at low interest rates.

The aim of the merger was to monopolize all processes of production, whether of pig-iron or of finished steel, in Korea and Manchuria as well as in Japan proper. But notwithstanding pressure upon them, several of the strongest independents remained outside. Steel production became especially profitable in Japan after 1931, a factor which made joining the merger less urgent from an economic point of view than formerly. Producers outside the new combine in 1934 represented at the time a steel producing capacity considerably greater than that of the new company. Steel production is to-day about equally divided between these private producers and the semi-official Government trust, in contrast with pig-iron production, 90 per cent of which the Government controls through the Nippon Seitetsu. The trust exercises a powerful influence over the steel industry in such matters as price control and tariff policy.

Among the leading private steel producers are the following: Japan Steel Tube Company (Nippon Kokan), a producer of pig-iron, bars, shapes, rails, tubes, and special steels; Kawasaki Shipbuilding & Dockyard Company (Kawasaki Zosenjo), which produces among other things ingots and castings for its own use; Kobe Steel Works (Kobe Seikojo), producer of bars, forgings, castings, and ordnance; Asano Shipbuilding Company (Asano Zosen), producer of plates for its shipyards, etc.; Kokura Steel Company (Kokura Seiko, formerly Asano Kokura) producer of ingots and castings, etc. Numerous other companies specialize in such products as sheets, hoop iron, barbed wire, and pipes and tubes, and many new enterprises for the production of various types of alloy steel have come into existence in the last two or three years. Several of these private steel companies have their own blast furnaces as well as iron ore and coal mines.

Korea Ore and Pig-Iron

Korea alone among Japan's colonies has an important place in the Empire's iron and steel industry. Since the World War the annual output of iron ore has usually been greater in Korea than in Japan, the total output from 1931 through 1935 accounting for slightly over one-half of Empire production. Pig-iron has been produced in Korea since the World War, but the peninsula has no steel industry of importance. During the period 1931-35 about 40 per cent of the iron ore and 85 per cent of the pig-iron produced were shipped to Japan for further processing.

Practically all the iron mines in Korea, including those owned by the Japanese Government, have been operated by the Mitsubishi Iron & Steel Company. The Mitsubishi Company operates the Sainei-men mine, which is State-owned; prior to 1931 ore from this mine supplied up to 20 per cent of the requirements of the State steelworks at Yawata. Most of the Korean output of pig-iron comes from the Kenjiho plant owned by the Mitsubishi Company. The company's steel mill there has not been successful, however, and was closed until recently.

In recent years there has been renewed interest, particularly on the part of the Japanese Government, in a more extensive exploitation of the Korean iron mines. The Nippon Seitetsu has negotiated with the Mitsubishi interests looking toward closer integration of the Korean properties with the industry in Japan proper. Particular interest attaches to the Mozan iron mines which contain large reserves of low-grade ores. Recent efforts of the Nippon Seitetsu to purchase these properties from the Mitsubishi interests have failed. The imperial five-year plan for the iron and steel industry contemplates further extension of the operations of the former concern in Korea, one phase of which is the construction by the company of blast furnaces at Seishin, the new port of north-eastern Korea on the Japan sea, to utilize iron derived from the Mozan deposits.

Manchuria

The chief iron and steel enterprise in Manchuria is the Showa Steel Works, an affiliate of the South Manchuria Railway Company. It was formed in 1933 with a capitalization of ¥100 million to take over the properties of the Anshan Iron Works which had produced pig-iron since 1919. About four-fifths of the Manchurian output of pig-iron during 1926-33 came from Anshan. The remainder was produced principally by the Penhsihu Coal & Iron Company, established in 1911. This company, which is under Japanese control and is an enterprise of the Okura interests, possesses the finest coking-coal deposits in Manchuria. Besides supplying its own needs, it furnishes coal of superior quality to the Showa Steel Works. Both companies export pig-iron to Japan, but the Showa Company now converts the larger part of its output into steel, principally for consumption in Manchuria.

The exploitation of the Manchurian iron deposits has been expensive. The cost of production of pig-iron has been high, owing to the inferior quality of the ore and the necessity of concentrating it. Capital investments have been excessive in proportion to actual output, whether of pig-iron or steel, and it is probable that neither the former Anshan Iron Works nor the present Showa Steel Works could ever have operated without financial aid from the Japanese Government. Efforts to bring these Manchurian enterprises within the control of the Japan Steel Manufacturing Company (Nippon Seitetsu) have so far not been successful.

Government Subsidies and Control

The Japanese Government have assisted the iron and steel industry continuously since the World War with subsidies, both direct and indirect. Direct subsidies have been granted to producers of iron and steel for use in shipbuilding and to shipbuilders. Under the Iron and Steel Industry Encouragement Law, in force with various changes since 1918, direct subsidies have been paid to producers of pig-iron and of special products, such as steel rods. In 1927 from ¥3 to ¥6 per ton were paid to producers of pig-iron; in 1933 from ¥1.5 to ¥3. The amounts paid have varied according to the use for which the pig-iron was intended, the largest being paid for that to be used in making steel. Under further provisions of the law indirect subsidies, in the form of waiver or remission of the business tax, business profits tax, and income tax, are given to individual producers engaged in producing pig-iron and converting it to steel.

Lighting in Shops and Stores

By R. O. ACKERLEY, G.E.C. Illuminating Engineering Department, London

THE field covered by this title is so wide that it is desirable to limit the subject as much as possible, bearing in mind that the essential respect in which shop lighting differs from other forms of lighting must be that directly, or indirectly, it should contribute to the art of selling.

The term shop premises includes restaurants, offices, waiting rooms, and so forth, and there is no reason for treating the illumination of such portions of the shop in any different way from that in which similar rooms in any other building would be treated. It is therefore proposed to consider the subject purely from the point of view of those forms of lighting which may help the primary object of the establishment of any shop, namely, the selling of goods.

Lighting may contribute to this end in various ways of which the following are probably the most important:—

- (a) By attracting from greater or less distances the attention of passers-by.
- (b) By drawing attention to bargains and special lines.
- (c) By showing off goods to the best possible advantage, in such a way as to bring out their quality.
- (d) By creating a pleasant atmosphere for customers.
- (e) By combining with the last quality features of decoration and novelty that in themselves attract customers to the building.

Light Sources

It is proposed to deal with the different classes of lighting in the above order, but, first, consideration will be given to the various electric light sources which are available. Up to a very short time ago, the tungsten filament lamp in some form was practically the only electric light source which could be employed for the interior lighting of shops. Cold cathode neon tubes and hot cathode electric discharge lamps have for some years been used for exterior lighting effects, but up to 1936 tungsten lighting had been used practically without exception in shop interiors.

Since that date two forms of light source have been introduced which may play a revolutionary part in the shop lighting field. The first of these is the Osira fluorescent tube. For the present only their salient features, in so far as they may affect shop lighting, will be described. These features are their high efficiency, which for the first time enables cold cathode electric discharge tubes to compete economically with tungsten lighting; their low surface brightness which allows them to be used, if desired, as visible light sources; and the fact that by blending suitable colors a resulting color of light of almost any degree of warmth can be obtained, including an approximation to natural daylight far closer than that obtained from tungsten filament lamps.

The other light source which bids fair to revolutionize shop lighting is the Osira high pressure mercury lamp. By itself this light source is deficient in red light, but the introduction of 80 and 125 watt Osira lamps gives us a source which is ideal for blending with tungsten filament lamps. The excess of red light in the tungsten lamp fills the deficiency of red light in the Osira lamp, the resultant light when mixed in suitable proportions being again very close to that of natural daylight,

while an additional vitality is imparted to the goods on which such light falls.

Exterior Floodlighting

The importance of attracting a customer from a distance needs very little stressing. The provision of lighting for this purpose is a form of trade name advertising and a constant reminder to the public that a shop selling a certain class of goods exists at a certain place.

The two principal methods for attracting attention from a distance by light are floodlighting and electric signs. Wherever a building has any claim to architectural distinction, and where any reasonable portion of the facade can be seen from a distance, floodlighting offers the most dignified and effective solution (see fig. 1).

To attract attention from a great distance there should usually be some floodlighting high up on the building; towers, cornices, etc., lend themselves well to this purpose, but it is essential, if

much of their utility is not to be lost, that there should be some form of connecting link between the floodlighted upper portion of the building and the lower portion. Unless this is provided, there is danger that by the time the prospective customer gets near the building, the floodlighting will be above his line of vision and will have no connection in his mind with the shop it is intended to advertise.

From the point of view of building design, it is of the greatest importance that the possibilities of floodlighting should be envisaged in the early stages. There are buildings already in existence where the architect has appreciated the importance of floodlighting to such an extent that the facade has been definitely designed with a view to its floodlighted appearance.

If it is too much to suggest that in commercial buildings facades should be designed more from the point of view of their night appearance than their day appearance, it is at least sound to suggest that facilities should be provided so that if the building is to be floodlighted, the floodlights can be mounted to give the best possible effect. The provision of suitable projecting balconies, parapets, etc., behind which floodlights can be concealed sufficiently offset from the building to make good light distribution

practicable, make all the difference between good and bad results. Where no facilities exist for screening floodlights on the building it is possible to mount the floodlights on projecting brackets, screening them with some sort of decorative leafwork or similar design, but a building so treated will never look so effective as one in which the floodlights are concealed in the building structure itself.

The choice of correctly designed floodlighting equipment and its correct placing is essential if satisfactory results are to be obtained. The requirements as regards light distribution are directly dependent on the shape and architectural design of the building and the facilities available for placing floods; floodlights which would give excellent results in one position may be entirely unsuitable in another. In many cases a very limited offset is available and equipment specially designed for such conditions must be employed. Correct focussing and training are also of supreme importance and special care in this respect will amply repay the time spent on it.

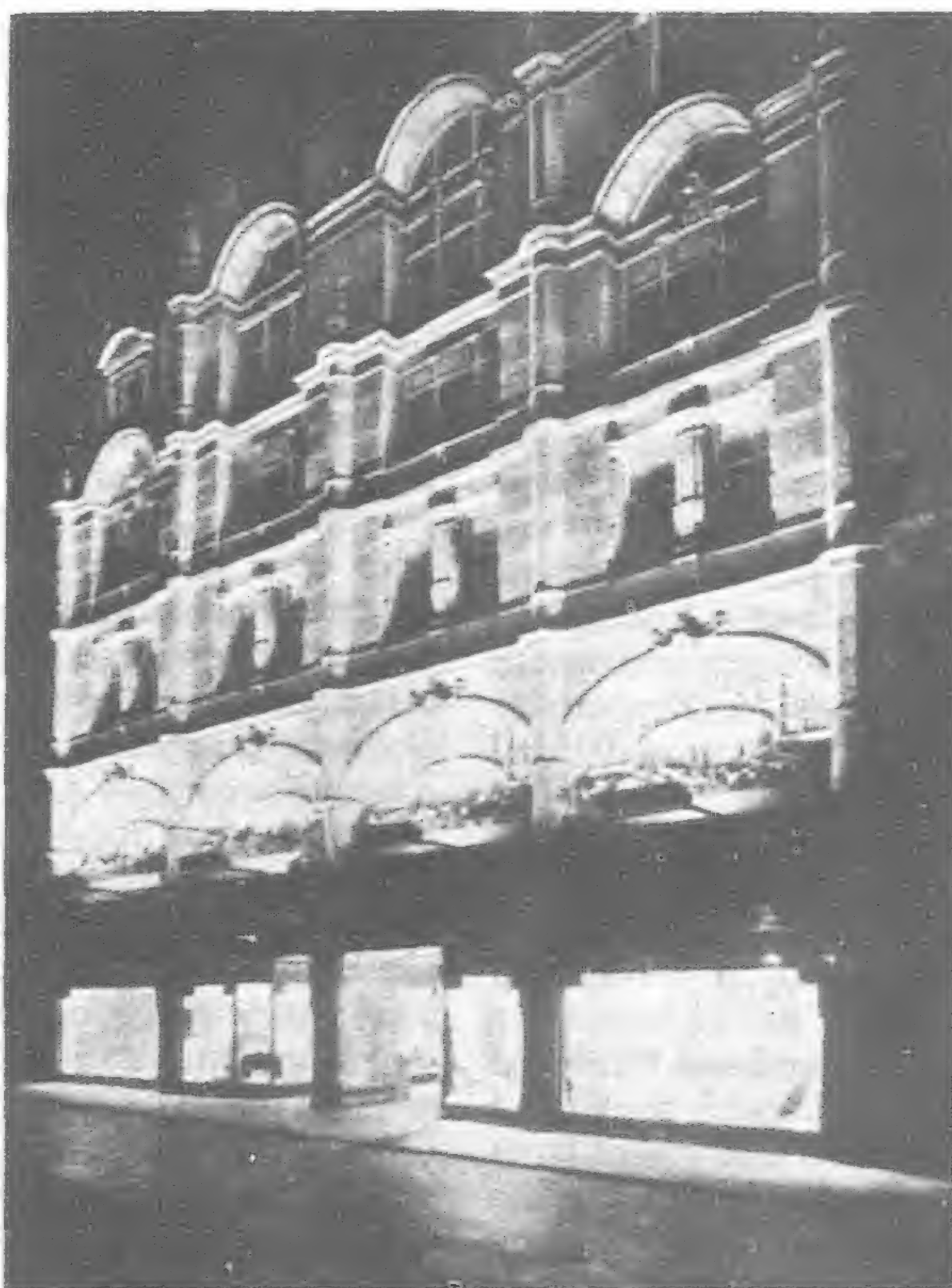


Fig. 1.—Floodlighting provides one of the simplest and most dignified means of attracting attention from a distance

Signs

The other method by which attention can be attracted from a distance is by the use of illuminated signs. There are many types of signs on the market and one consideration in selecting a sign for this purpose would seem to be that its day appearance must not be unattractive. Here again the appearance of the whole building will be much improved if the sign can be embodied as part of the main structure and, as in the case of floodlighting, it is important that there should be some visual connection between any sign at the top of the building and the lower portion of the building (fig.2). From this point of view vertical signs are particularly effective, and a good example of how such signs can be made an integral part of the building—looking equally effective by day and night—is found in the type of sign where metal letters are shown up in silhouette against an illuminated cove built into the corner of the building. Many other types of sign with attractive day and effective night appearance are available, of which space does not permit description, but some reference must be made to neon signs. The effectiveness of neon tubes, whether in the form of letters or purely for providing a spectacular display, has been recognized for many years, but until recently the range of colors available was limited and shopkeepers were justifiably demanding something new. To-day, neon tubes are available in twenty-five colors spread over the complete spectrum and including some extremely attractive pastel shades. These tubes, many of which are manufactured under Cleora patents, are also notable for their high efficiency and brilliancy.

Apart from permanent signs, for which some sort of provision will usually have to be made on the original building structure, it is often desirable to erect temporary signs to draw attention to sales, or other special occasions, and it is suggested that some sort of provision in the stonework, to which metal frames for the mounting of temporary signs can conveniently be fixed, should be an essential feature of any large store. The importance of adequate provision of electric mains, preferably in the form of watertight plug connections, should not be overlooked.

A recent development in outside lighting, which does not appear under the heading of signs or floodlighting, is the use on the outside of the building of built-in lighting features as part of the building structure. While in the majority of examples available in this country, such built-in features have been confined to the window and door surrounds and the fascia, there is no reason to limit them in this respect, and they may still become one of the recognized forms of luminous advertising in commercial architecture.

In this connection, recent developments in the technique of glass manufacture provide new possibilities for the architect wishing to obtain spectacular lighting effects. Glass bricks call for a very specialized lighting technique while colored glass rods and the varieties of fluted glasses now available lend themselves to such external effects.

There is one other method of attracting the attention of people close to a building which



Fig. 2.—An effective electric sign and neon display linking the top of the building with the shop windows

should not be overlooked, and that is by the use of "stunt" window lighting, involving moving or flashing devices in conjunction with spectacular color effects. The use of such window lighting can only be regarded as in the same class of sales aid as floodlighting and signs, in that it is designed to attract attention rather than to show off the goods in the window to the best advantage. For this reason, in view of the importance of show windows as a straightforward sales aid, the employment of "stunt" lighting, except perhaps in one window out of a number or as an occasional short period change in smaller premises, should not be encouraged.

The Value of Show Window Lighting

Under the second heading given at the beginning of this article, namely, attracting attention to bargains available, and emphasizing the quality of goods, the most potent aid is good window lighting. As a preliminary to considering this subject it may be interesting to examine to what extent good lighting increases the value of show windows. A survey recently carried out

in both central and suburban areas shows that, calculating capital charges on a ten year basis, the cost of a first class lighting system is only seven per cent to ten per cent of the cost of the windows. As, however, the windows are useless after dark unless illuminated, this small percentage extra cost adds approximately 33½ per cent to the working hours of the displays. These remarks might, of course, be said to apply to any system of lighting which made the goods visible, but other tests indicate that the stopping power of an illuminated window display is directly affected by the intensity of the illumination as the following table shows:

TESTS TAKEN IN A MAIN SHOPPING THOROUGHFARE

<i>Illumination— Foot-candles.</i>	<i>No. of people stopping per hour.</i>
15	200
40	244
100	284

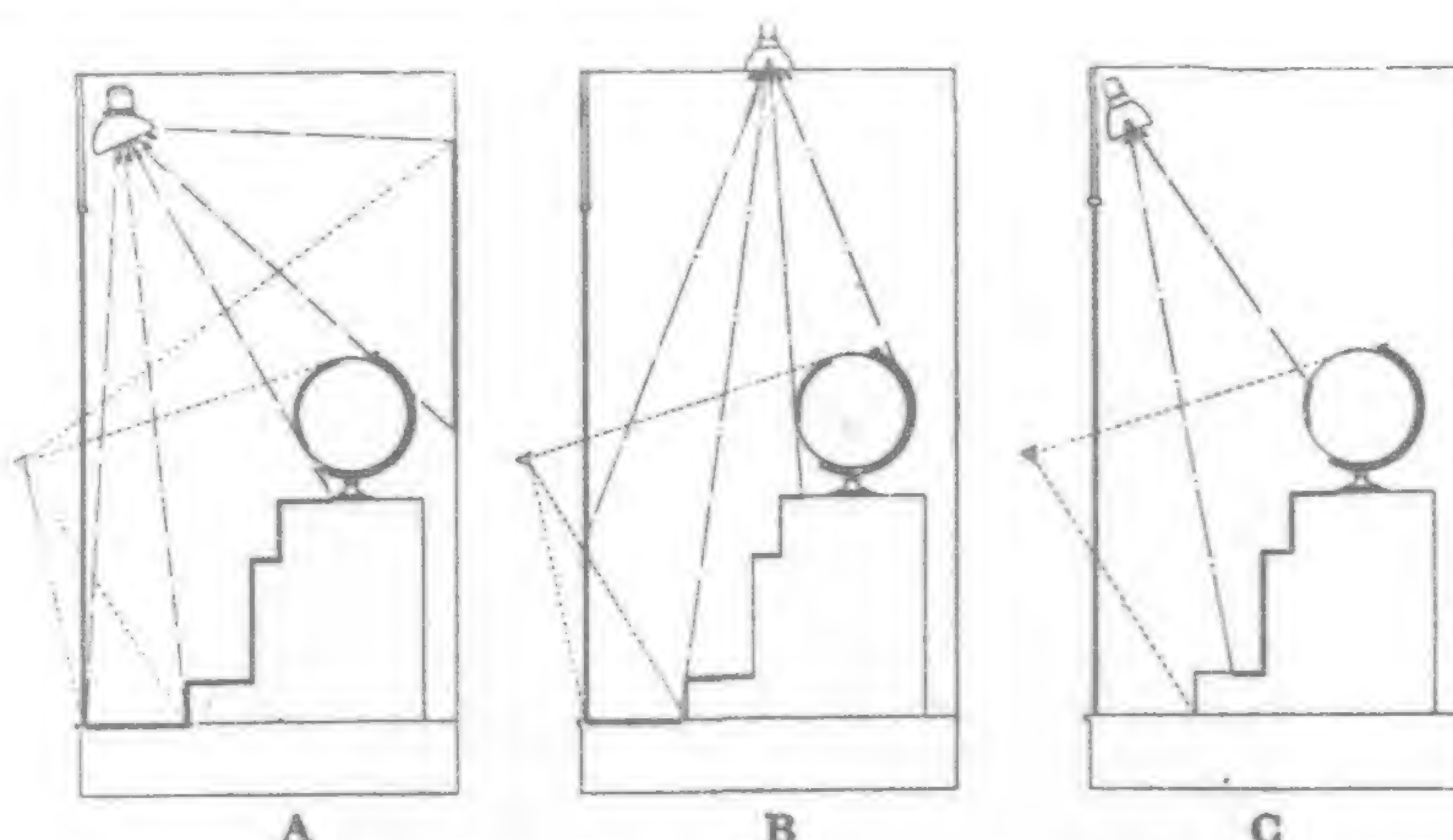


Fig. 3.—Illustrating the amount of display space in a window effectively illuminated under various systems when viewed by an observer outside the window. Fig. A shows the light being directed evenly all over the window and from the front in such a way that it strikes the side of goods toward the observer. Fig. B indicates how with overhead mounting the side of the goods toward the observer receives relatively little light. Fig. C shows a system where the light is concentrated mainly into the center of the window and much of the display space at the front and back relatively is unilluminated

Mirror Glass Reflectors

For many years the most popular and generally recommended type of window lighting has been by means of mirror glass reflectors placed immediately at the back of the window pelmet and directing the light more or less evenly over the whole of the window from front to back and from top to bottom.

There is a natural tendency for enterprising shopkeepers to ask for something new, but while modern and original ideas undoubtedly can be introduced as methods of employing such reflectors, the fundamental lighting principles on which this system was designed are as sound to-day, in relation to tungsten lamps and light sources of similar general shape, as they

were when they were introduced and, subject to the possibilities presented by the employment of new forms of light source, any modification in window lighting should be based on the use of such directional lighting reflectors.

The reason for the superiority of this system for general lighting of shop windows may be simply explained. The customer looking into the display window can only see those sides of the goods which are facing towards the glass, and therefore to be useful light must strike the goods from that direction. To achieve this in the best way, the lighting equipment must be placed as close as possible to the glass and can only be installed at the top or bottom or somewhere intermediate between these two positions. In the intermediate position, the lighting equipment would interfere with the clear view of the goods displayed, while if the lighting equipment is placed at the bottom, it tends to occupy useful window space and is at the same time almost inevitably visible to the customer in the street. At the top of the window, however, it can be placed right outside the line of vision and concealed from view behind the pelmet. The use of individual reflectors for each lamp allows maximum flexibility in spacing and switching and lends itself to the use of color screening when desired. Furthermore, the reflectors, when properly designed, can be extremely efficient in the sense that a very high percentage of the light output of the lamp can be directed where it is most useful, that is to say, on to the goods (fig. 3).

Certain types of window lighting reflector tend to concentrate a very high intensity of light on to a comparatively narrow area in the center of the window. While this treatment may be suitable in a limited number of cases where the goods are of such a nature that they lend themselves to display in the center of the window, and the center only, as a general rule the window-dresser likes to have latitude to adjust his display without limitation as to the position in the window where his goods will show to advantage, and for this reason a type of reflector which distributes light evenly over the whole area is far more flexible than one of the more concentrating type. With this system, goods right against the front glass of the window and those high up at the back are as well illuminated as those in the center, and, if it is desired to increase the light in any particular part of the display, auxiliary spot and floodlights can be employed.

Window Lighting Auxiliaries

While spot and floodlights should be considered primarily as auxiliaries to the general system of lighting, there is an increasing tendency in the better class shops to employ such units for short periods without the general lighting so as to give special dramatic effects. In this way one article or even a small part of an article may be made to stand out



Fig. 4.—Indirect lighting in a motor-car showroom shows off the highly-polished body work



Fig. 5.—An original method of using architectural lamps for counter illumination

in brilliant relief against a dark or colored background. This is a typical instance of the manner in which the flexibility of an individual reflector system can be used to provide "something different."

Various other forms of auxiliary lighting can be introduced which, in one way or another, add life or variety to the resultant display. Such systems include the installing of special architectural features, such as laylights, box recesses and other architectural motifs, to conceal the reflectors, auxiliary side and bottom lighting, and luminous units in the window.

With regard to the latter, however, great care must be exercised, as if such luminous features have too great a surface brightness they will make it difficult to distinguish detail in surrounding objects, and thus detract from the window display instead of enhancing it. A good way, therefore, of obtaining such luminous effects is by means of indirectly lighted insets.

The very latest type of luminous effects is obtained with the aid of fluorescent dyes and pigments illuminated by Osira black glass lamps. With such a display the articles treated stand out in brilliant colors against an unlighted background. The method is therefore more applicable to advertising material and symbolic displays than to actual goods.

Arcades and island windows are always a problem to the illuminating engineer as there is difficulty in lighting a window in such a way that the illumination is effective and at the same time concealed when viewed from all sides. The author's own opinion is that an island window should be lit from the street frontage as, first, this is the direction towards which the main scheme of dressing is normally directed and, secondly, by the time the prospective customer has walked round to the other side of it one of the main purposes of the lighting, namely attracting the customers to look at the windows, has



Fig. 6.—Studying light distribution and intensities from a mixture of tungsten and Osira mercury lamps arranged as shown in Fig. 12



Fig. 7.—"T.O.T." shop window lighting (from a mixture of tungsten and Osira mercury lamps) adds life and sparkle to the goods displayed

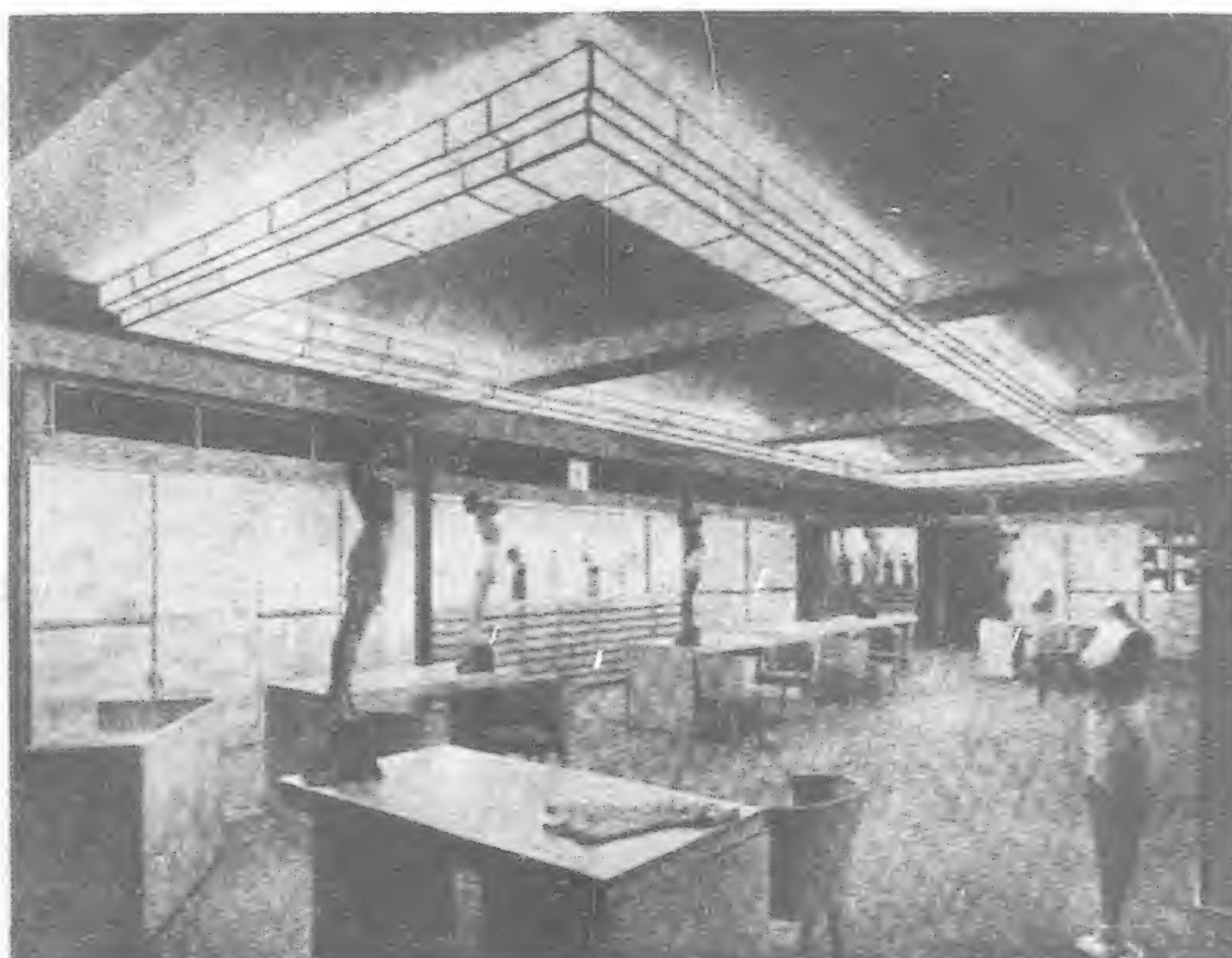


Fig. 9.—Specially designed architectural lighting units in the corset department of Harrods, Ltd., London

been achieved. An attempt to light an island window from all sides usually results in spoiling the effect from all sides.

The general lighting of arcades, as distinct from the lighting of the windows themselves, should be confined to the use of units of low surface brightness so that the eye is not drawn away from the window displays. Many arcades rely on the light spilt from the windows for their sole lighting, but, as an alternative to this, indirect lighting from the top of the showcase may be employed to advantage, while architectural lighting, provided surface brightness of individual units is kept sufficiently low, will often add a touch of life to the arcade as viewed from across the street. Fluorescent tubes and architectural lamps are particularly suited for providing illumination in such positions (see fig. 8).

Color in Show Windows

As regards the use of color in window lighting, the question of "stunt" lighting to arouse the curiosity of passers-by has already been mentioned, but for straightforward window lighting,

designed to show off the goods to the best possible effect, color should only be used subserviently to the main lighting, otherwise the goods themselves will suffer from color distortion. Striking effects can be made, however, by concentrating the color, either in one fixed batten, or changing by means of flashers or dimmers, on the background, while the goods in the foreground remain illuminated with white light.

Certain classes of goods benefit by a slight touch of color in the light. Furs, for example, show up best under a slightly bluish light while certain food-stuffs are enhanced by a tint of amber or pink. Such tinting needs to be very slight and is best obtained by means of special reflectors in which the glass is tinted. By this method the reflected light takes on the color of the glass through which it passes and blends with the direct light from the lamp which remains unaltered.

The T.O.T. System

The possibilities of combining the light from high pressure



Fig. 8.—Sunlight tubing in the arcade provides soft lighting to contrast with the brilliance of mirror glass reflector lighting in the windows



Fig. 10.—A combination of louvred overhead lighting and spotlights imparts a dramatic quality to this display of models



Fig. 11.—Special decorative diffusing glass pendant fittings are used to light the new Oxford Street premises of D. H. Evans & Co., Ltd., London

mercury and tungsten lamps have been referred to at the beginning of this article. Experiments have shown that this can be done to great advantage in shop window lighting. The 80 watt Osira high pressure mercury vapor lamp, being of the same size and having the same light center length as the 150 watt Osram tungsten lamp, lends itself to employment in existing shop window reflectors, and tests have indicated that to obtain the best mixing of the two colors of light, one Osira lamp should be placed between two tungsten lamps. This has led to the introduction of the "T.O.T." (Tungsten-Osira-Tungsten) system of shop window lighting developed by the G.E.C. (see figs. 6 and 7). The proportions of tungsten to Osira can be varied to requirements, two 150 watt tungsten lamps to each 80 watt Osira mercury lamp giving a very fair approximation to daylight color; it is therefore far more suitable than plain tungsten for the illumination of windows containing fabrics and dress materials. Where color value is of less importance, two 100 watt tungsten lamps to each 80 watt Osira lamp give an added vitality and sparkle to the windows, while at the rates normally paid for current for window lighting, the high efficiency of the lamps results in a definite saving in running cost on each point equipped with an Osira lamp. Under the T.O.T. system the lighting layout must essentially be considered in groups of three lamps, and where individual reflectors are employed the three reflectors constituting a T.O.T. unit should be as close together as possible. Where it is not desired to have reflectors close together right across the window, and necessary gaps must be obtained between one group and the next, fig. 12.

As an alternative to using separate reflectors for each lamp, specially designed reflectors each housing three lamps—one Osira and two tungsten—can be used and are recommended in new buildings where it is not desired to take advantage of existing reflectors.

Osira fluorescent tubes in specially designed troughs have also been used successfully for shop window lighting either as the sole source of light or as an auxiliary to tungsten lighting.

Interior Lighting, the Relation Between Light and Sales

Turning now to the interior of the shop, where the showing off of the goods to the best advantage and the creation of a pleasant atmosphere are the chief requirements, combined with features of decorativeness and novelty that in themselves attract attention, it is proposed to deal mainly with the question of straightforward interior lighting designed to help to sell merchandise. It is well known that certain classes of goods tend to show up to particular advantage under certain systems of lighting. For instance, glassware can be made to sparkle under a direct system where it would appear comparatively dead under an indirect system.



Fig. 12.—Arrangement of "T.O.T." lighting system in which one Osira mercury lamp is placed between two tungsten lamps forming a series of groups of three lamps



Fig. 13.—Dual purpose fittings of the type shown are used to provide either indirect or semi-direct diffused light to suit the goods displayed in many of Lewis's stores throughout Great Britain

say that a temporary improvement or drop in sales of goods of a particular class was influenced by the lighting and not by any extraneous conditions. Experiments, however, were carried out recently by the engineer of a number of large stores in England with the object of testing the effect of interior lighting on sales, and some convincing results were obtained. The system on which he worked was along the following lines. Assuming at the beginning of the tests that the lighting in the corresponding department of several different stores was of similar character, he would alter the lighting in one store leaving the others unaltered. If following on this change in lighting, there was an increase of sales in the one store without any corresponding increase in the others, he would then introduce the new form of lighting into a second store. Up to this point he would still be up against the difficulty that he could not say how far the original increase in sales was due to the lighting, or how far it might be due to some entirely extraneous circumstance. If, however, he found, as was sometimes the case in the experiments made, that at the second store a similar increase in sales took place as soon as the lighting was changed, he had at least a *prima facie* case for thinking that the system of lighting had had a direct bearing on the sales.

If the result of such experiments were to show that a certain type of lighting, as, for instance, general diffused lighting, was the best for all classes of goods it would make the lighting problem very simple but, in practice, this is not the case, and it is found that some classes of goods respond best to lighting with a strong directional element, others to totally indirect lighting, and yet others to general diffused lighting, or a combination of any two of the above systems.

In the case of a general store dealing with all classes of goods, such results may lead to complications as, in the first place, in many cases the class of goods varies on one floor without any dividing line between the departments, and a different type of fitting in various sections of the same floor might look curious; and, secondly, in a store of this nature the management often like to feel that, at any rate as regards certain areas, they can change the nature of the goods displayed at short notice so that goods of seasonal, or other special interest, may have the most prominent positions at the proper times. It would lead to some complication if, every time the goods were so changed, the lighting fittings also had to be changed. There is, however, a method by which this difficulty can be overcome, at least to some extent, by having a dual purpose fitting wired on separate circuits, which can give two or more systems of lighting, either

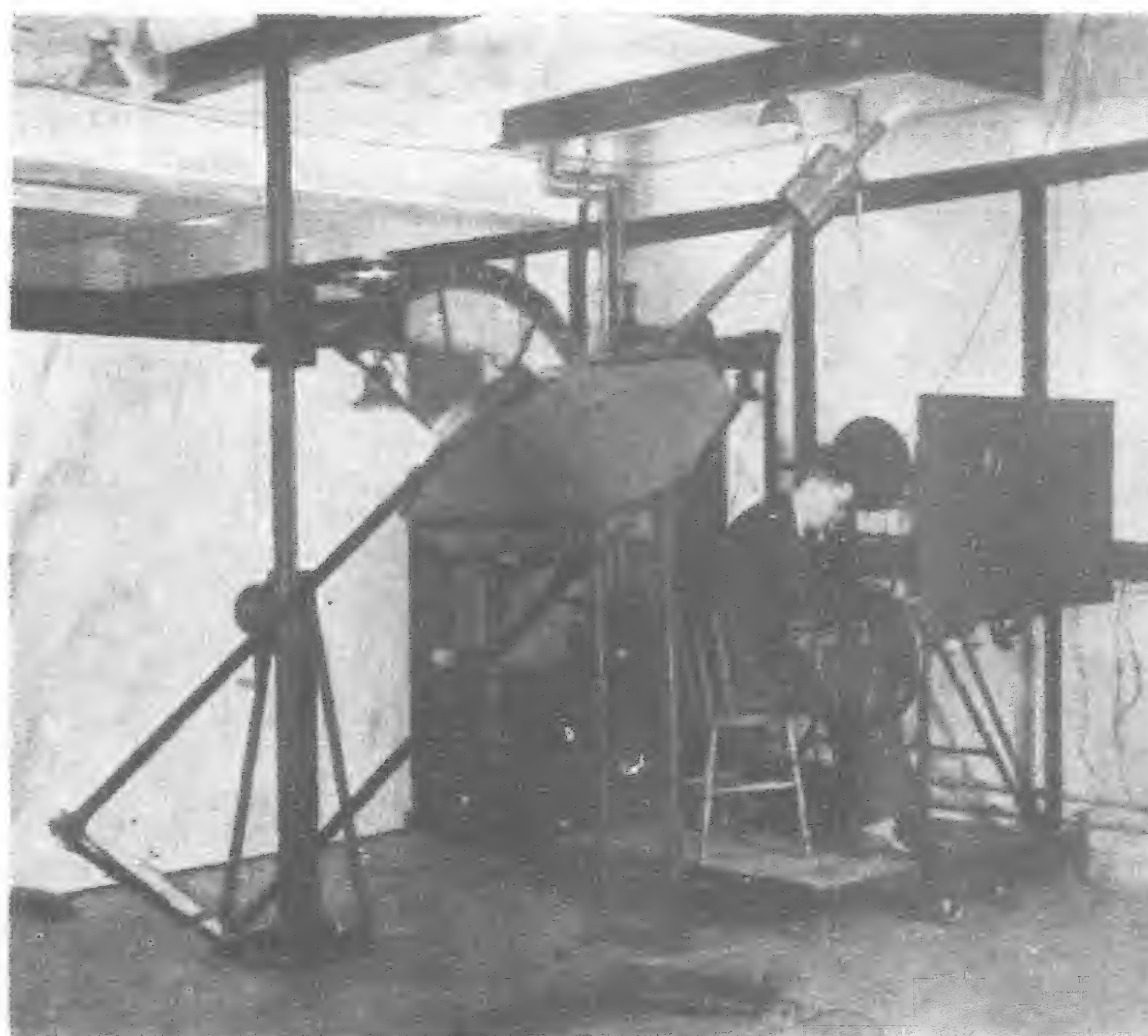


Fig. 14.—Examining the light distribution of a diffusing glass fitting with the aid of a polar curve machine at the G.E.C. Research Laboratories, Wembley

separately or in combination. Such a fitting might consist, for instance, of an upward portion concealing an indirect reflector throwing the whole of its light on to the ceiling, and a lower portion having lighting characteristics similar either to a diffusing glass fitting, or a directional lighting fitting. With such a fitting it is possible at a moment's notice, to change the lighting from general diffused effect to a totally indirect effect, or *vice versa*.

Such a fitting, fig. 13, has been used in some of the experiments referred to above, and it may be interesting to examine some of the results obtained and the probable reasons.

General Diffuse Lighting

The table on this page records a few typical results from which hard and fast rules cannot be made, but the results are interesting as an indication of what may be expected with other classes of goods. Where a shop is being built to sell goods of one nature only, then obviously the best form of lighting can be chosen for those goods. Where the shop is being built as a general store, dual purpose fittings may be installed as described above, but fittings of this nature are necessarily more expensive than straightforward equipment and where expense is a primary consideration, general diffusing fittings which combine to some extent the qualities of both direct and indirect lighting will probably prove the most satisfactory form of standard equipment (see fig. 16). Fittings of this class have been generally recommended for shop lighting for some time past and are found satisfactory in the majority of cases. It is, however, frequently desirable to augment this general lighting with directional lighting units on special areas both to provide high spots and to bring out special features of the goods, fig. 17.

High Intensity Counter Lighting

There is a tendency in all modern lighting schemes for illumination intensities to increase and in no field of lighting do high intensities give a better return than in shop windows and interiors. For some years illumination values of 100 foot-candles and upwards



A



B

Fig. 15.—A comparison of the illustrations above shows how the addition of high intensity louvre lighting over the display (illustration B) adds vitality and increases contrast without altering the general appearance of the sales floor

have been common practice in well lit shop windows, while in interiors, whereas a shop was considered well lit at five to ten foot-candles a few years ago, to-day 15 to 25 foot-candles are found in many English stores, and appreciably higher intensities are in vogue in America. The provision of high intensity lighting in windows is a simple matter as the lighting equipment can be hidden and the customer is outside the brightly lit area. In interior lighting, on the other hand, the problem of providing high intensity artificial lighting so that there is no sensation of oppression or glare to a customer looking in any direction is far more difficult. The problem is one of directing the requisite amount of light on to the

Type of Goods	Type of Lighting Giving Best Results	Suggested Reason
Carpets	Direct Lighting	Shows up contrast between colors. As low reflection factor colors are usually involved there is no danger of overbrightness, nor are there possibilities of harsh shadows.
White Goods, Linens, etc.	Indirect Lighting	The reflection factor of the goods is so high that direct lighting tends to create dazzle.
Glassware	Direct Light (preferably embodied in the display shelves)	Creates sparkle and gives life to the display.
Dress Materials	Directional Lighting	To give just that amount of shadow and gloss which shows material to good advantage.
Evening Dresses	Indirect Lighting (High Intensity)	Such goods are normally made for use under highly diffused lighting.
Furniture, Ironmongery	General Diffuse Lighting	Directional lighting would give too great high lights while totally indirect would not give sufficient.



Fig. 16.—General lighting by means of high efficiency diffusing glass fittings is simple and effective when adequate lighting is more important than decorative appearance

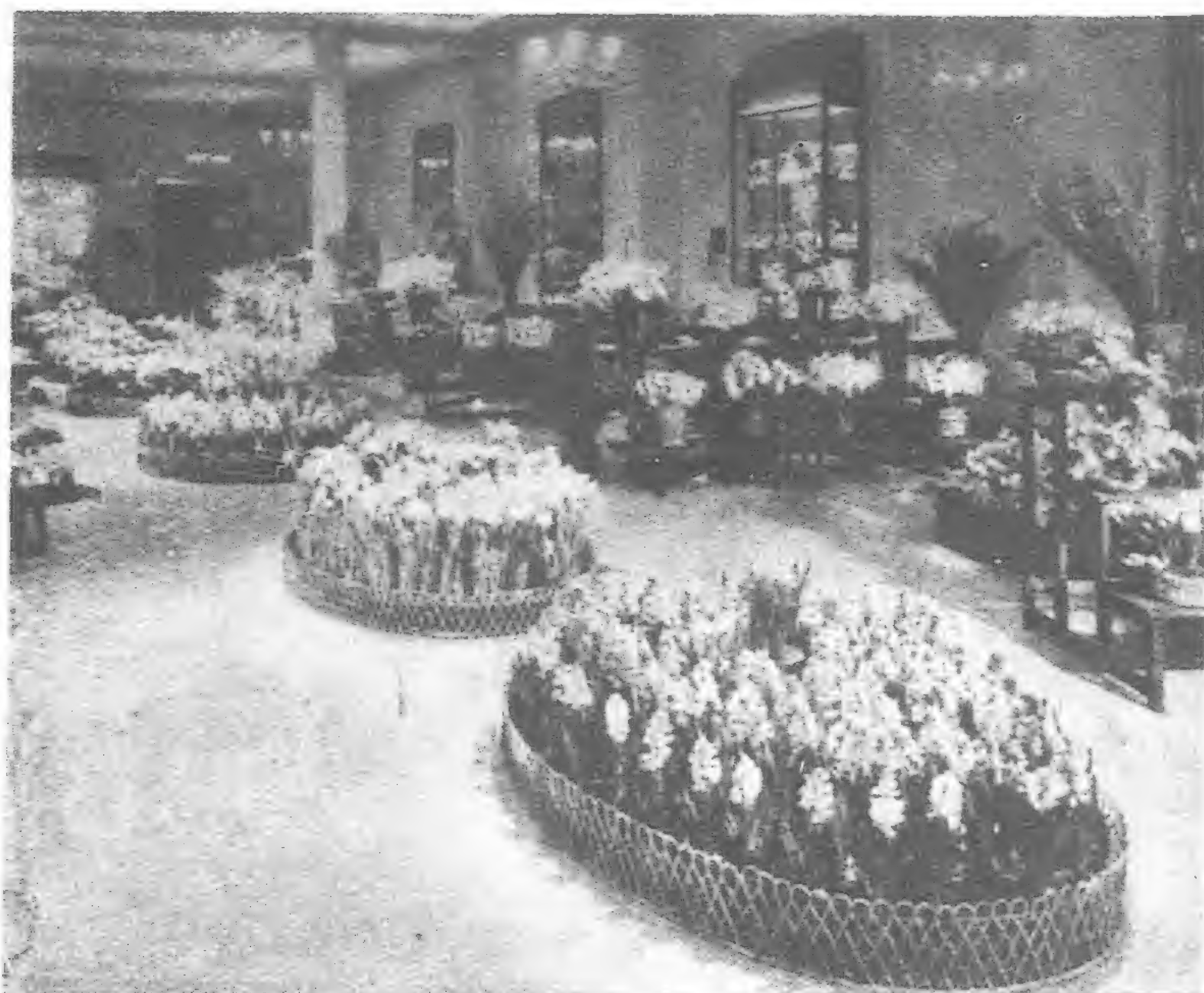


Fig. 17.—Concealed floodlights directed on to the flowers in the London showrooms of Moyses Stevens, Ltd., effectively augment the general lighting



Fig. 19.—Another example of Osira fluorescent tube lighting which brings out the natural colors of the fruit and flowers in the Coventry Street Corner House of J. Lyons & Co., Ltd.

goods without having visible light sources of excessive brightness. The most successful and simple way is by means of fittings embodying a mirror glass or other form of concentrating reflector mounted flush with the ceiling and directing its light downwards on to the displayed goods, suitable louvres being provided to cut off the light at an angle of about 45° so that no bright light is directed into the eye of the customer at any normal angle of vision (see fig. 15). This system, however, leaves the ceiling relatively dark and may give a tunnel effect. The overhead lighting should therefore be combined with indirect lighting on to the ceiling of just sufficient intensity to light the ceiling. By this method intensities of 50 to 100



Fig. 21.—A display of china on glass shelves is effectively illuminated by means of lamps behind diffusing glass panels

foot-candles can be obtained on the display counters without any sensation of glare and with relatively small consumption of current. Show cases and fixtures will often be found to provide suitable mounting and concealment for reflectors to give the small amount of indirect lighting required. Alternatively, decorative floor or counter pylons will serve the purpose. As another alternative where plenty of height is available, the louvre units may be suspended below the ceiling and mounted in a composite fitting designed to give the necessary upward illumination.

Osira Fluorescent Tubes

The possibilities of decorative treatment of fittings in any



Fig. 18.—Osira fluorescent tubes provide 15 foot-candles of soft shadowless lighting in this store

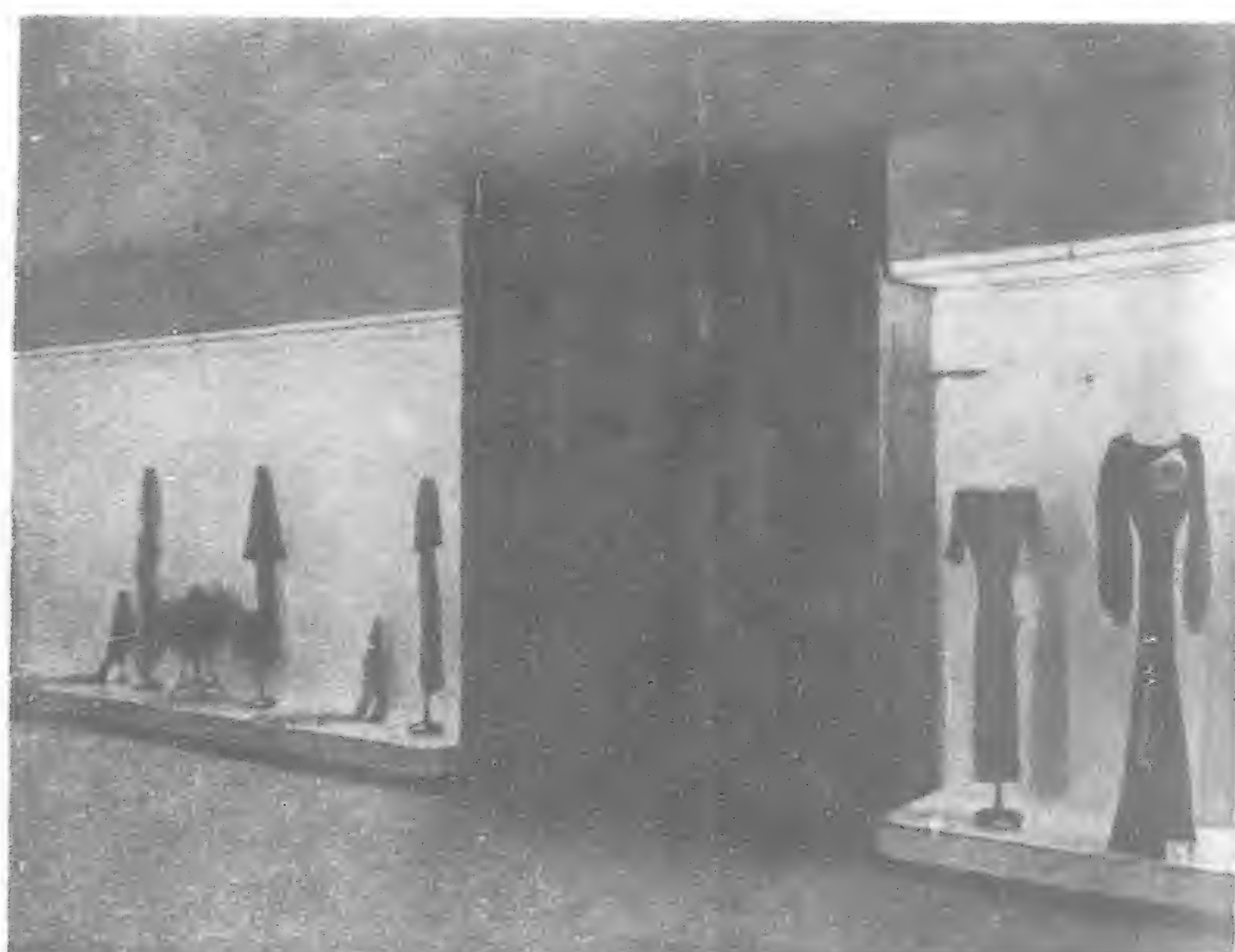


Fig. 20.—An example of overhead lighting applied to the display cases built into a wall in the Oxford Street showrooms of D.H. Evans & Co., Ltd., London

of the forms of lighting are unlimited and a matter for collaboration between the architect and fittings designer (see figs. 5, 9, 11). This subject is so vast that it must necessarily be left out of the present article. Some reference must, however, be made to the possible uses of

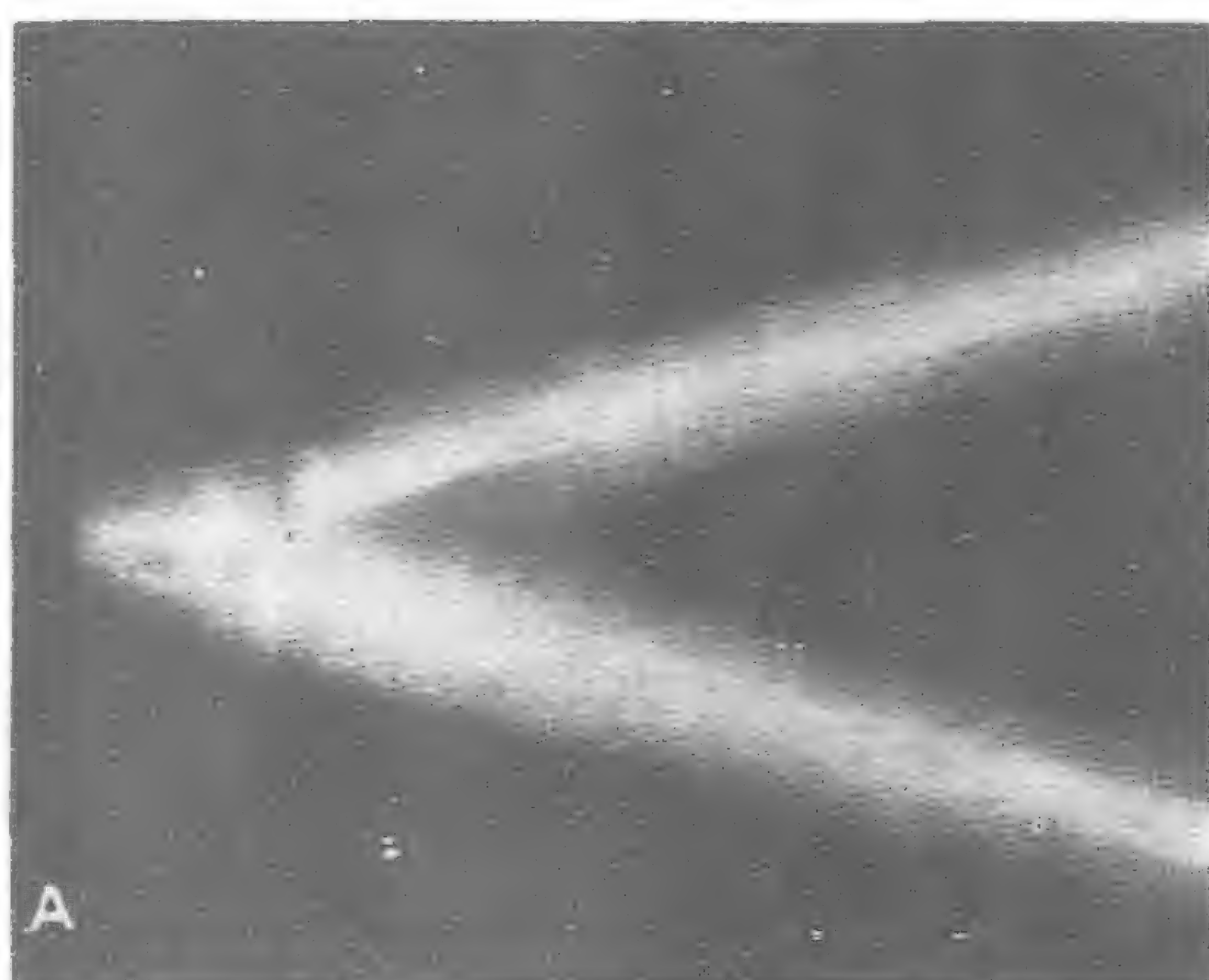
Osira fluorescent tubes for interior store lighting. While these tubes can be used as light sources in cornices or behind laylights, in glazed troughs and similar ways, probably the greatest possibilities lie in their use as visible light sources, in conditions which allow both their high efficiency and intrinsic decorative appearance to operate to the maximum advantage. As has already been stated, combinations of tubes can be found to bring out the natural colors of almost any object in a way which cannot be attained by tungsten lighting, while the well known effect of apparent increased vitality which is obtained from the light of other electric discharge light sources is equally apparent in the case of these tubes. Already sufficient work has been completed in the lighting of shops with fluorescent tubes to indicate that their use is likely to revolutionize shop lighting practice in the very near future (figs. 18 and 19).

Some of the qualities of efficiency, color and vitality that are claimed for fluorescent tube lighting can also be claimed for the T.O.T. system, modified for interior use. For this purpose suitable combinations of tungsten and Osira high pressure mercury lamps are blended in the interior lighting fittings. This can be done in a variety of ways ranging from a simple and inexpensive diffusing glass fitting taking two or more lamps of suitable wattage to the complete equipment of a laylight with lamps mixed in suitable proportions or a system of indirect Osira lighting combined with direct tungsten lighting.

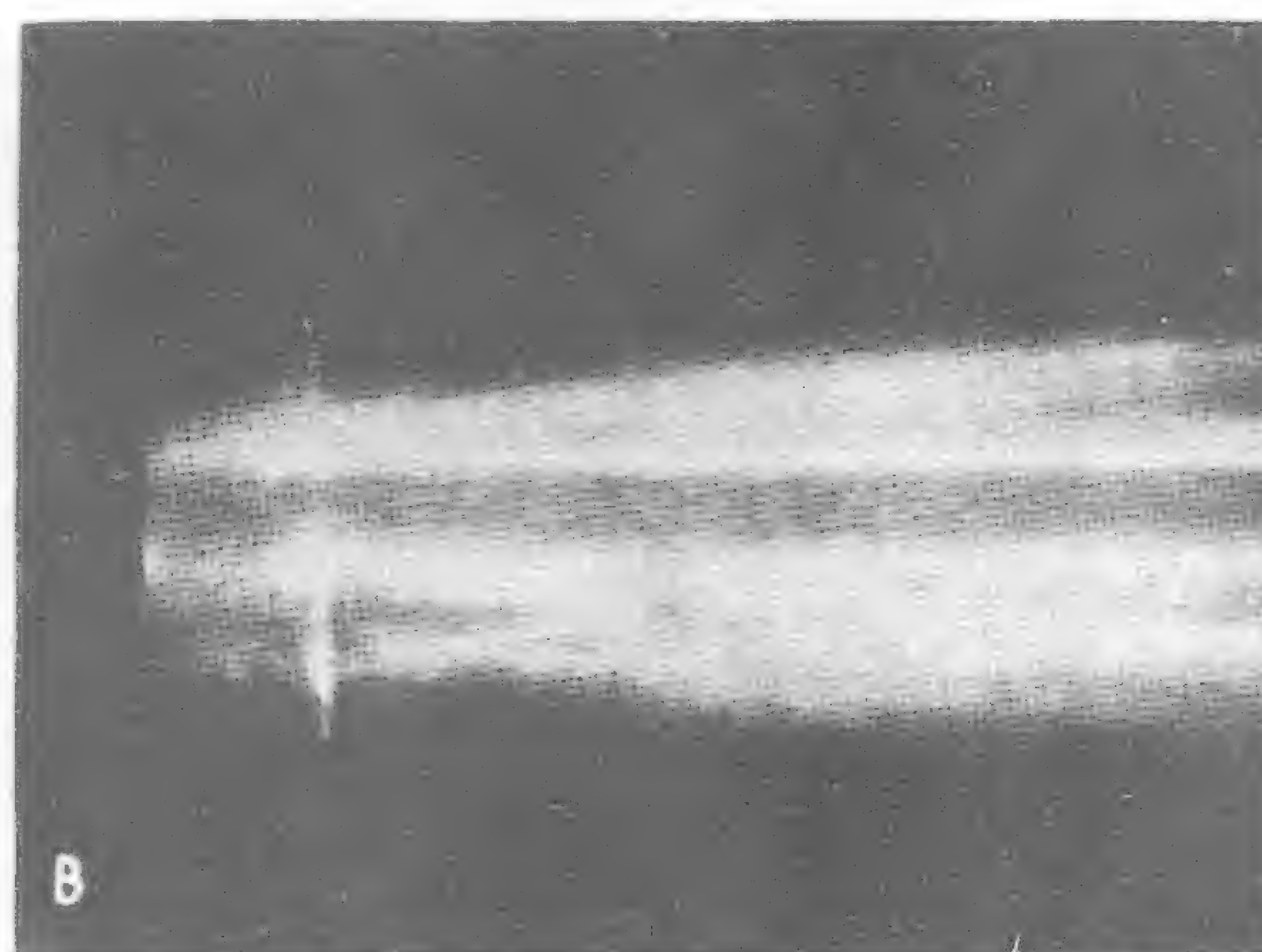
Showcase Lighting

Before leaving the subject of interior lighting of shops, there are two subsidiary forms of lighting which are too important to pass over without reference. The first of these is the question of the provision of adequate lighting in counter display cases, showcases, etc. Apart from the fact that such illumination tends to give life to the whole of the interior of the shop, it enables the interior showcases to take the place of additional windows for the reason that they attract the prospective purchaser's eye to all sorts of goods which might otherwise have been overlooked.

Owing to the limitations of depth and lack of facilities for concealment, this class of lighting usually has to be done with striplite lamps in an ornamental reflector, but in larger showcases small reflectors, of a type similar to those used for shop window lighting, can sometimes be employed, and in other cases reflectors of this type can be mounted above the top of the showcase, concealed, if necessary, behind ornamental moulding and shining down through a glass top (fig. 20). If such a system



A.—The incident ray emerges from the flute of the reflector as sharply defined as when it entered



B.—The adjacent reflected rays diverge only to the degree required in order to avoid striation



C.—With a badly designed flute, adjacent reflected rays diverge so greatly as to nullify all light control



D.—The ray is here trapped within the glass wall, never to emerge at all

Fig. 22.—Illustrating A, B, the proper control of a light beam and C, D, the collapse of the beam with good and faulty types of mirror glass reflector

is adopted in instances where goods are arranged on shelves, it is essential that the upper shelves should be well set back, or that all shelves should be made of glass, otherwise obviously no light will penetrate from the top of the case to the lower shelves.

As an alternative, fittings comprising a striplite lamp and metal shield can be clipped on to each shelf, the metal shield serving the double purpose of throwing the light on to the goods and, by means of a cut-out stencil, providing a display notice. Architectural lamps can be used for a similar purpose, and instead of using a metal reflector, the lamp itself can be provided with a transparent cover on the back on which a display notice is written. In the case of wall cases and display shelves, lighting through diffusing glass panels set in the top, bottom or sides is an effective alternative (fig. 21).

The risk of overheating goods displayed in showcases is also often a problem, and in such instances the use of Osira fluorescent tubes provides a solution, for they are even

smaller in bulk than striplite lamps and dissipate far less heat per unit of length while still providing adequate light.

The other form of auxiliary lighting which must be mentioned is the provision of internal signs. Apart from illuminated counter and display signs, it is essential, in the up-to-date shop, that adequate notice should be displayed to guide customers from one department to another. For this purpose illuminated signs are the ideal form of equipment.

Choice of Equipment

An article on shop lighting would not be complete without some reference to the points which should be considered when choosing lighting equipment. First cost is relatively unimportant as the money expended in current consumption, lamp replacement, cleaning and other maintenance charges during the life of the fitting is likely to be many times that spent on the fitting in the first instance. The importance of flute design in relation to mirror glass shop window reflectors has been discussed previously in this *Journal*, and it was shown that relatively small apparent alterations in the depth and pitch of the flutes, such as to the layman might seem to be matters of appearance only, might make a considerable difference both to the overall efficiency and degree of light control of the reflector (fig. 22).

Equally the quality of the reflecting surface is of vital importance. Not only must the initial reflection factor be as high as possible but the reflecting surface must be proof against deterioration. Even where the silvering, in the case of glass reflectors, appears to be untarnished, the glass itself, if of bad quality, will tend to absorb more and more light as the months pass without any obvious change in the appearance of the reflector as a whole. In the case

(Continued on page 439)

G.E.C. Electric Drives at a Portland Cement Works

IN choosing a site for the manufacture of Portland cement, one of the most important considerations is its proximity to suitable sources of raw material, and in this respect the quarries and cement works owned by Alpha Cement Ltd., at Rodmell, near Lewes in Sussex, are ideally placed. High chalk from the downs and low chalk near the marshes adjoining the River Ouse are available in large quantities, and as a result of close control by chemical analysis the Rodmell Works is now producing Portland cement of high quality at a rate of some 110,000 tons per annum.

A further advantage of the Rodmell site is its location within the area of the Ringmer and District Electrical Supply Co., Ltd., which sponsored one of the most enterprising developments in rural electrification resulting from the construction of the National Grid. An unlimited supply of electric power is readily available, and in view of the great advantages of electric motor drives for cement making machinery the Rodmell Works was completely electrified. In this connection an extensive contract for electrical equipment was placed by Messrs. Edgar Allen & Co., Ltd. (who installed the original plant) with The General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2. and Witton Engineering Works, Birmingham. Upwards of 60 "Witton" motors, ranging up to 400 h.p. in size and aggregating 1,600 h.p. in total output, together with a quantity of switch and control gear are installed for driving a wide variety of cement-making machinery including wash mills, tube mills, rod mills, kiln and pumps, together with coal handling plant and auxiliaries. Many of these motors have to operate day and night under severe conditions of fluctuating loads and overloads in hot, wet, or dusty surroundings, and absolute reliability is essential since any interruption in the flow of material may have serious consequences to the kiln and other parts of the plant.

The raw material is obtained from "high" and "low" quarries, being dug by bucket type electric excavators and conveyed by diesel locomotives to the washing plant (at a little distance from the main works), where the preliminary treatment takes place. Chalk from the "low" quarry (after reduction in a set of kibbling rolls to 5-in. lumps) is tipped into the first wash mill, and the resulting "slurry" after passing through the wash mill screens, is transferred by means of unchokeable centrifugal pumps either to the second wash mill or to storage tanks. The electrical equipment in this section of the washing plant comprises a 150 h.p. 960 r.p.m. 440-volt G.E.C. synchronous induction motor (with liquid starter and oil circuit breaker), driving line shafting through two belt reductions; the line shaft drives the kibbling rolls and the wash mill, the slow speed of the latter being obtained by a bevel and crown wheel. The 150 h.p. motor is shown in Fig. 2 which reveals the severe conditions under which it works. The washing plant also includes a three-throw ram pump (for general service water supply) driven by a 15 h.p. squirrel cage motor.

The slurry from the first wash mill and chalk from the "high" quarry after passing a roller mill are mixed in the correct propor-

tions in the second wash mill, which is fitted with screens to break up the material further. The product of this mill is screened and then passes by gravity to a wet tube mill, which is driven through two gear reductions and flexible couplings by a 150 h.p. slip-ring motor. The slurry is then pumped to the storage tanks, which are air-agitated, compressed air being supplied at a pressure of 30 lb. per sq. in. by a rotary compressor direct coupled to a 50 h.p. slip-ring motor. Each of the storage tanks has a capacity of 16,000 cu. ft., which allows the wash mill section to be closed down at week ends without any stoppage on the kiln.

The kiln department in which the slurry is transformed into "clinker" is one of the most interesting sections of the works. The slurry is pumped from the storage tanks into a small mixer agitated by a 10 h.p. squirrel cage motor, and thence it is passed by a three-throw ram pump driven by a 15 h.p. squirrel cage motor through worm and spur gearing into a calcinator feeding into the kiln. Since a breakdown in the kiln feed would cause increased coal consumption, damage to the kiln lining, and reduced quality of the product, a spare slurry pump of the centrifugal type is provided and is driven by a 15 h.p. squirrel cage motor with oil-immersed auto-transformer starter.

The kiln (Fig. 1) is of the rotary type, fired with pulverized coal, which is introduced with the requisite amount of air for combustion purposes by means of a blower fan. It consists of a steel tube lined with firebrick and fitted with four cast steel tyres running on pairs of rollers. The total length is about 220-ft. and the diameter 9-ft. (except at the hot or "clinkering" end where it increases to 10-ft. 6-ins.); the total weight is about 500 tons. The kiln is driven at a speed of from 1 to 1.9 r.p.m. by a single 85 h.p. 440-volt variable speed slip-ring motor (with faceplate controller) through triple reduction spur gearing; the first two

sets of gears are totally enclosed, and the third open with a spur wheel surrounding the kiln shell and connected to it by tangential spring plates. The "slurry" travels slowly down the whole length of the kiln to the "clinkering" zone, being successively dried, calcined, and sintered as the temperature increases from about 50°F. at the point of entry to about 2,700°F. at the furnace end. Here the clinker is discharged on to a grate cooler, which reduces the temperature and at the same time preheats the combustion air. It is next taken by a shaker conveyor and elevator (both driven by a 20 h.p. squirrel cage motor) to the coal and clinker store referred to later. A view taken from the hot end of the kiln, showing the motor and drive, is given in Fig. 1.

The next step in the cement manufacturing process is the grinding of the clinker (with a small addition of gypsum to control the setting time of the cement) in the clinker mill house. Preliminary grinding is carried out in two rod mills, each of which rotates at about 20 r.p.m. and is driven through gearing from line shafting; a 50 h.p. slip-ring motor is geared to one of the line shafts (which also drives a screw conveyor and elevators through belting). The discharges from the rod mills are passed to a large tube mill,

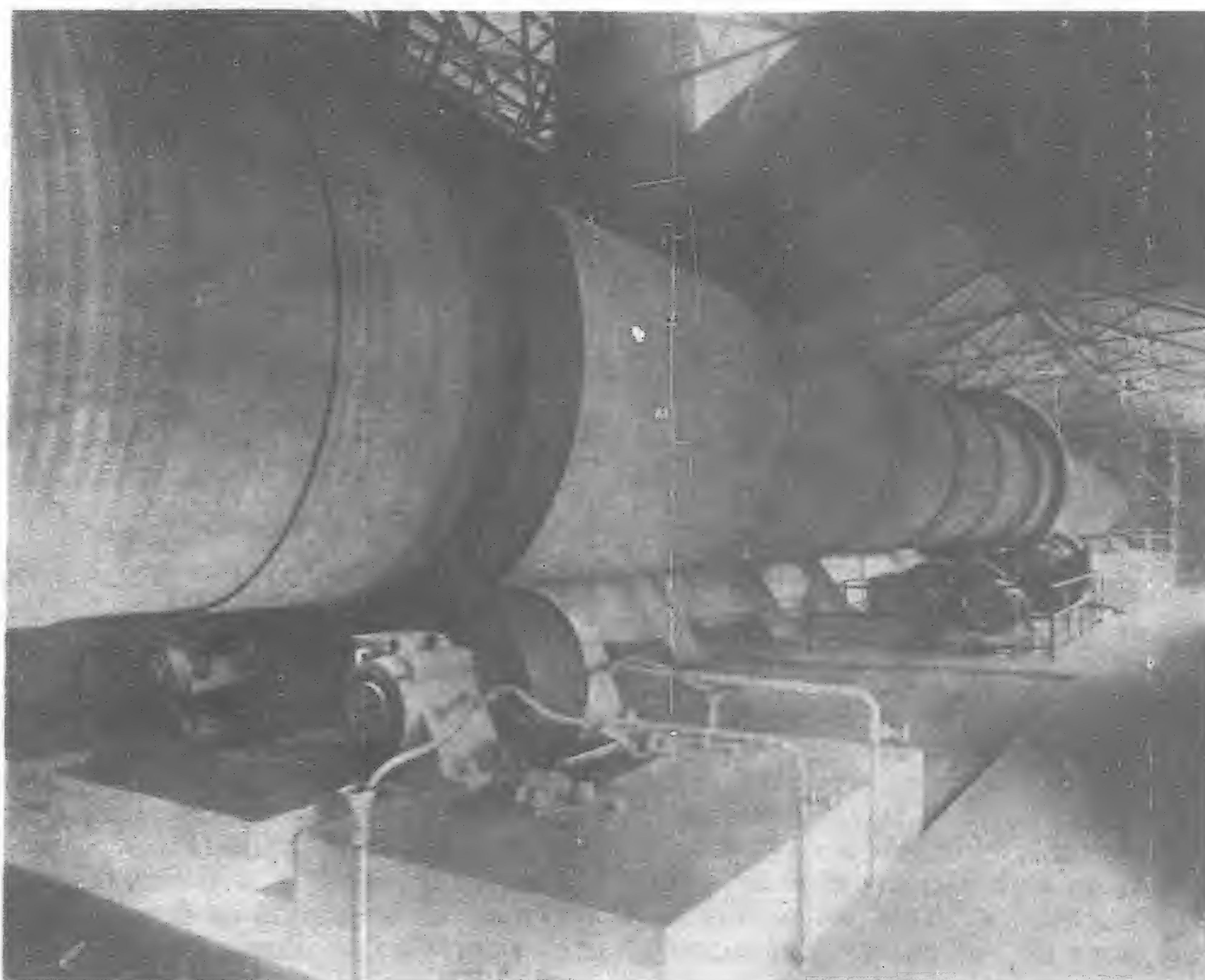


Fig. 1.—Rotary kiln driven at slow speed (1 to 1.9 r.p.m.) by an 85 h.p. 960 r.p.m. G.E.C. totally enclosed variable speed slip-ring motor through triple reduction gearing

which is driven through gearing by a 400 h.p. G.E.C. synchronous induction motor for further grinding. The rod mills are provided with a feed table driven by a 5 h.p. squirrel cage motor.

From the tube mill the cement, now in its final form, is discharged to a pneumatic conveying system working at a pressure of 28 lb. per sq. in. and is taken to storage bins, from which it can be extracted as required, the pneumatic conveying systems are supplied with air by three reciprocating compressors driven by slip-ring motors, two of 45 h.p. and one of 70 h.p. Valve type bag packers are employed to fill the cement bags to the correct weight at the rate of 35/50 tons per hour; two packers are driven by 20 h.p. squirrel cage motors.

An extensive coal handling plant is installed for supplying pulverized coal to the kiln. On arrival at the works, the coal is discharged from the trucks into a receiving hopper, from which it is fed to a vertical elevator (driven by a 10 h.p. squirrel cage motor) leading to a band conveyor, which takes it to the coal and clinker store; alternatively coal is discharged from vessels on the River Ouse and transported by ropeway. It is withdrawn from storage as required and taken via a magnetic separator and elevators (driven by a 15 h.p. squirrel cage motor) to hoppers leading to an air-swept ball mill, which is gear-driven by a 75 h.p. slip-ring motor.

In the coal and clinker store, which occupies a building 400-ft. long by 60-ft. wide, wet and dry coal is distributed (and, where necessary, mixed) and the clinker is handled by five-ton overhead crane fitted with three slip-ring motors, 25 h.p. for hoisting, 12 h.p. for longitudinal travelling, and 4½ h.p. for cross travel.

A fitting shop attached to the works contains a shaping machine, drill, screwing machine, saw, two lathes, and two grinders, all driven from line shafting by a 20 h.p. motor.

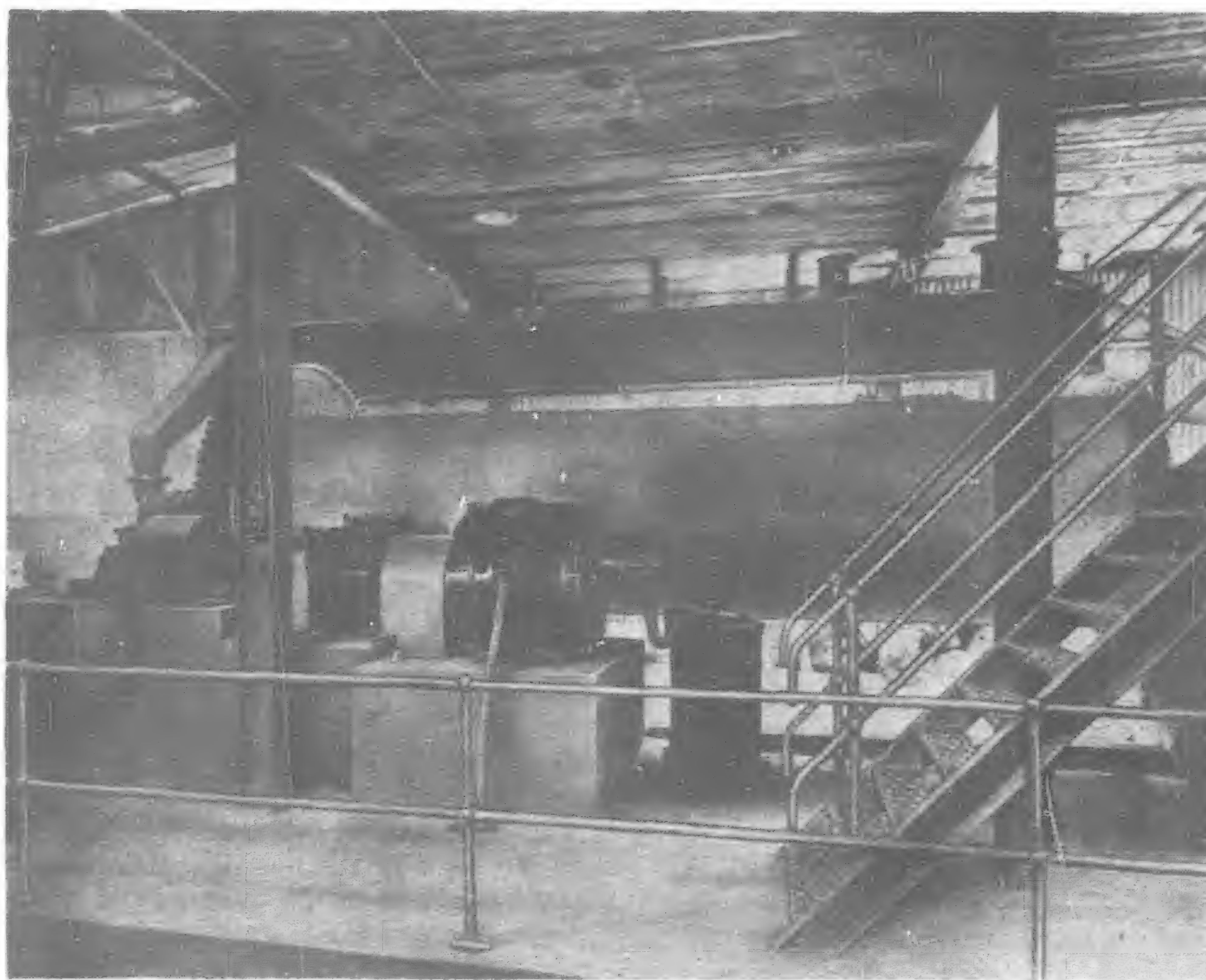


Fig. 2.—A 150 h.p. 720 r.p.m. G.E.C. slip-ring motor driving a wet tube mill through two gear reduction and flexible couplings

With the exception of the large synchronous induction motors on the chalk wash mill and the clinker tube mill and the kiln motor, which is totally enclosed, all the motors mentioned are standard 440-volt "Witton" induction machines of the protected type running at about 720 or 960 r.p.m. The slip-ring motors, which form the great majority, are usually fitted with brush-lifting and short-circuiting gear (in view of the possible presence of cement dust) and have oil-immersed rotor starters; the small squirrel cage motors have either direct-to-line or auto-transformer starters, according to size.

In view of the rapidly increasing use of electric discharge lamps for industrial

illumination, it is interesting to note that "Osira" electric discharge lamps are used at the Rodmell Works for lighting the wash mill, the coal and clinker store, and the machine shop. Eight 250-watt and two 400-watt lamps are installed in parabolic or dispersive type industrial reflectors. The two 400-watt "Osira" lamps in the clinker store replaced twenty-six 200-watt tungsten filament lamps, enabling double the floor area to be illuminated with a greater intensity and at about one-sixth of the running cost.

Current is taken from the 10,000-volt three-phase 50-cycle mains of the Ringmer and District Electrical Supply Co., Ltd., and stepped down to 440-volts in substations at the main works and the quarry. The latter provides a separate supply for the wash mill plant, the 440-volt circuits being controlled by two G.E.C. industrial pedestal switchboards. The two units on the left control feeders to the chalk excavator and wash mill and to the wet tube mill and its auxiliaries, while the units on the right control various motor drives.

In conclusion acknowledgment should be made to Alpha Cement, Ltd., for their assistance in the preparation of this description and for permitting its publication.

Revision of the Nine Power Treaty and the "Open Door"

(Continued from page 410)

the powers is an "open door" policy which has some exceptions by way of recognizing special rights for Japan. Japan is not yet in the mood to attend to the grievances of third power nations in Shanghai and elsewhere in view of the fact that life and death struggles are still in progress. Indeed, it would be no wise policy for third powers to lodge sharp protests with Japan at this juncture against what these powers may regard as deviations from the "open door" policy. The "open door" is a product of the preceding century when China was regarded as a Western semi-colonial land for the exploitation of the Occidental powers. Protests based on such an obsolete and time-worn diplomatic policy can only irritate the feelings of the Japanese nation.

Of course ousting of third power rights and interests is not intended by Japan, and at this same time ousting of Japan's special rights in China through the so-called "open door" policy is not to be tolerated.

Lighting in Shops and Stores

(Continued from page 437)

of diffusing glass fittings the overall efficiency of two apparently similar glasses may vary by 30 per cent or more, while glasses unevenly blown will allow the filament to be seen through them. Other points of importance in selecting opal glass enclosed units are to ensure that the glass is properly annealed and will not crack of its own accord in service and that the globes are symmetrically blown and the necks cracked off so that the glasses will hang evenly. Finally it must be remembered that lamps have to be replaced and much time can be wasted in this process and in cleaning unless the fittings are designed with the question of maintenance ever in view.

The relative importance of efficiency and the decorative appearance in any particular case is one which must be judged on its merits, but for any given standard of decorative effect it is obviously desirable to obtain the maximum result for the least expenditure in running cost. Elaborate decorative fittings may be less efficient and more costly to maintain than simple less decorative equipment, but by proper optical and mechanical design, this efficiency can be brought to the maximum possible with the system employed.

The New P. & O. Liner "Canton"

ON her maiden voyage the 16,000-tons twin-screw liner *Canton* of the P. & O. Line arrived in Far Eastern ports in November, coming into Hongkong on November 12 and arriving at Shanghai, November 14. On her return voyage to England she is sailing from Shanghai on December 6. This is the first new British liner to come to the Far East in many years. A description of the vessel, republished from *The Engineer* is given as follows.

* * *

The twin-screw turbine-driven liner *Canton*, which was built and engined by Alexander Stephen and Sons, Ltd., of Linthouse, Glasgow, for the Far Eastern service of the P. & O. Company, sailed on Friday, October 7, from King George V Dock, London, on her maiden voyage to India, China and Japan, and called at Southampton the following day. The bookings for this outward passage were so heavy that the ship sailed without a vacant berth. In what follows is given a fuller description of the ship and her propelling machinery.

The principal particulars of the hull and machinery are as follows:—

HULL DIMENSIONS

Length overall	..	..	..	..	..	562-ft.
Beam	..	..	..	..	..	73-ft.
Depth to "D" deck	..	..	..	..	..	46-ft.
Gross tonnage	..	..	..	..	..	15,784
Net tonnage	..	..	..	..	..	9,255
Deadweight carrying capacity	..	..	..	..	..	10,320
Loaded draught	..	..	..	..	..	29-ft. 6-in.
Cargo capacity	..	..	7,700 tons, including	700 refrigerated	..	..
Designed service speed	..	..	..	..	..	About 19 knots

PASSENGER ACCOMMODATION

Number of first saloon passengers	..	..	..	..	260
Number of second saloon passengers	..	..	..	..	220
Officers, engineers, and crew	..	..	..	..	370
Total ship's complement	..	..	..	..	850

PROPELLING MACHINERY

Single reduction geared turbines

Number of turbine sets	..	..	..	..	2
Number of turbines, each set	..	..	..	3 h.p., i.p. and l.p.	..
Designed output, s.h.p.	..	..	..	..	18,500
Propeller speed, r.p.m.	..	..	..	..	125
Type of boilers	..	..	..	Yarrow side-fired oil fuel	..
Number of boilers	..	..	..	..	4
Working pressure, per square inch	..	..	..	..	435 lb.
Superheated steam temperature, deg. Fah.	..	..	..	..	725

GENERATING SETS

Number of main generating sets	..	..	..	4
Type of sets	..	..	..	Belliss Morcom-B.T.H.
Designed output, each set	..	..	..	450 kw.
Emergency generating set	..	..	..	One 60 kw. Ruston-Hornsey oil engine driven dynamo.

The liner is built to Lloyd's highest class 100 A1 and to the requirements of the Board of Trade for passenger ships. As shown in the accompanying illustration she has the typical appearance of modern P. & O. liners characterized by their raking stem, two masts, a single funnel, and a cruiser stern. The hull is painted black with the P. & O. white line and light stone colored upper works, as customary in the P. & O. Eastern service.

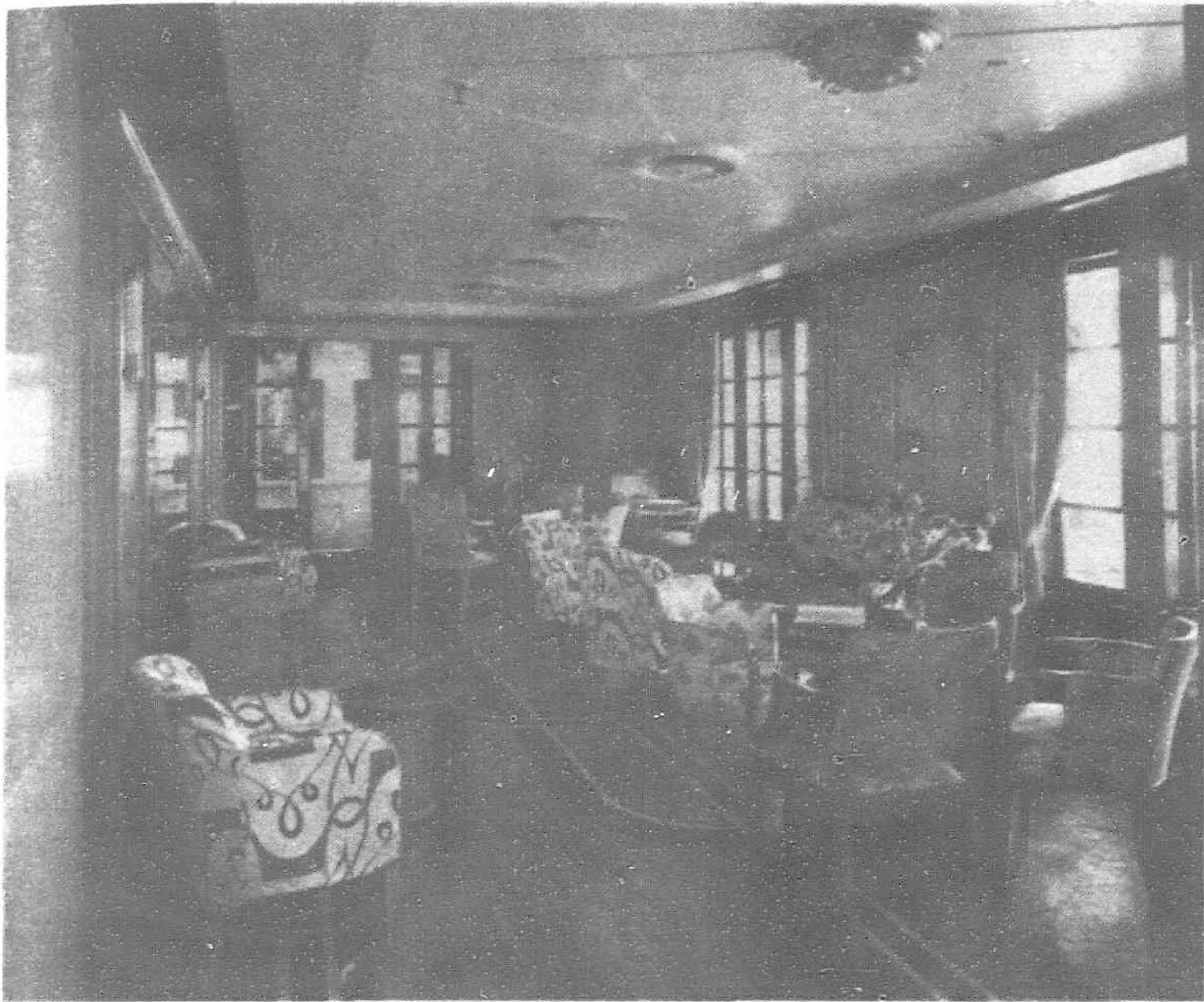
The hull is subdivided to meet the international safety requirements, and the doors in the watertight bulkheads are of the Scott-Ross type, operated by either hand or electric power, so that they can be instantaneously closed from the bridge in case of emergency. The cellular double bottom is arranged for oil fuel, fresh water, and water ballast, and large oil fuel bunkers are fitted at the sides of the boiler room and of the tunnel.

In view of the ever-increasing consumption of fresh water on board ship due to the unrestricted supply to all staterooms, baths, etc., numerous fresh water tanks are arranged on each side of the refrigerating machinery room and abreast the tunnels. There are eight decks, including the boat deck, and the upper three decks are arranged with promenade spaces for the use of the passengers.

The rudder is controlled by a Brown Brothers' electric-hydraulic steering gear with telemotor steering control from the bridge and mechanical control from the docking platform aft. Other deck auxiliaries include a high-power electric windlass. Two warping capstans are also fitted forward and two independent electric capstans are fitted aft. These were supplied by Clarke Chapman & Co., Ltd. The twenty-two cargo winches, which are of the Laurence-Scott pattern, and the boat hoisting gear are also electrically operated. No. 3 lower and upper 'tween decks are insulated for the carriage of refrigerated cargo. Hall's "Germania" system of refrigeration has been adopted for the provision chambers and the main CO₂ refrigerating plant is placed in a compartment forward of the boiler room immediately adjacent to the refrigerated spaces. Above the cargo spaces are the insulated cold stores on "F" deck for provisions, including separate rooms for meat, fish, poultry, vegetables, fruit, ice, etc., and everything to meet every possible demand in the dining-saloons and lounges. Other stores for stewards' use are adjacent, and the whole are arranged for speedy loading from ashore, by No. 3 hatch, or through six doors in the side of the ship, three each side. In addition to the main



Fig. 1.—The P. & O. Liner *Canton*, 16,000 tons, as she appeared in Shanghai on her maiden voyage

Fig. 2.—First class corridor lounge of the *Canton*Fig. 3.—Second class dining-saloon of the *Canton*

refrigerating plant the many cold cupboards, ice boxes, water coolers, etc., in the pantries and bars are refrigerated by individual "Hallmark" machines.

Amongst the special amenities provided for the passengers may be mentioned the Graham loudspeaker units in suitable positions for music and news, a wireless office for passengers' use, convenient to the main staircase, microphones from the navigating bridge for remarks from the captain to the passengers, and alarm gongs and bells from the bridge to all parts of the ship. The safety appliances also include a full equipment of lifeboats and life rafts. The lifeboats are built of steel and supplied by Mechans, Ltd., of Scotstoun, and each is large enough to carry ninety-nine persons, two having wireless apparatus and searchlight.

Protection against fire includes a Grinnell automatic sprinkler system supplied and fitted by Mather and Platt, Ltd., of Manchester; and fire-resisting bulkheads and doors at intervals throughout the accommodation. Fire extinguishing apparatus with both water and steam, Pyrene and Phomene chemical apparatus, and a Lux-Rich fire detecting and extinguishing system led to the navigating bridge from all parts of the ship complete the system.

The Passenger Accommodation

The first saloon passengers are accommodated on "B," "C," "D" and "E" decks, in single and double-berth cabins. On

"D" deck there are four *de luxe* cabins, and on "C" deck four special cabins, each suite having its own private bathroom and each being capable of expansion by adjacent cabins. The sports decks are on "A" and "B" decks, and the first saloon public rooms are arranged conveniently to the promenade on "B" deck, and a children's room is fitted forward with open-air playgrounds railed in for safety. Forward of the main stairway is a large observation lounge, and leading aft from the lounge are two corridor lounges which open into the dancing space. The dancing space, shown in Fig. 12, is part of the promenade deck, but is fitted with hinged glass screens for colder weather.

From the hall wide corridors lead to the verandah café, shown in Fig. 11 while abaft of the verandah café there is a permanent open-air swimming pond (see Fig. 9), which will give every facility for both sea bathing and sun bathing. The pond is finished in polished "Aranbee," a latex composition, and is suitably decorated.

The main stairway with an electric passenger lift runs down from "A" deck through all decks to the dining-saloon level on "E" deck, passing the lounges on "B" deck, the accommodation ladder entrance on "C" deck, and the main embarkation entrance with bureau and purser's office on "D" deck. The first saloon and second saloon dining-rooms are both on "E" deck, with the kitchens and pantries between them. Both saloons are arranged with small tables for parties of two, four, or six persons.

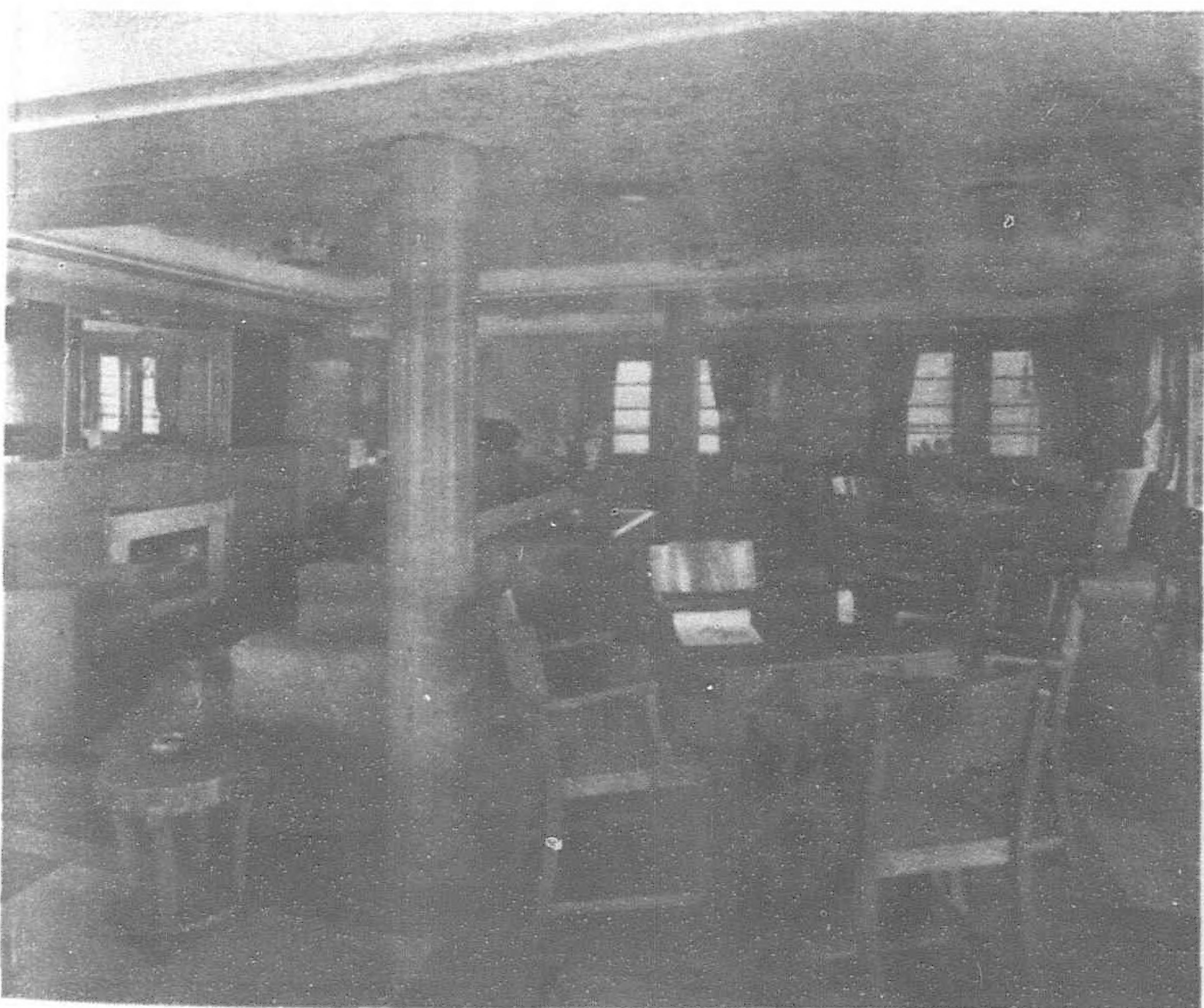
Fig. 4.—Second class lounge of the *Canton*Fig. 5.—Second class smoking room of the *Canton*



Fig. 6.—First class de luxe cabin of the *Canton*

The second saloon passengers are berthed on "E" and "F" decks aft. The second saloon lounge and smoking room are placed aft with an enclosed dance hall, similar to the first saloon hall, and on the promenade on "C" deck there is a large play room provided for the children.

The appointments of the accommodation for both first and second saloon passengers include every possible device for their comfort and convenience, such as hot and cold water to every state room, mechanical ventilation, ample lavatories and baths, with special ironing rooms for ladies' use, a hairdresser's shop, information bureau and offices, and a complete medical service, including consulting room, surgery, and fully equipped hospitals in the charge of a doctor, a matron and their assistants. The hospitals are arranged for complete isolation by deafened bulkheads from the ordinary life of the ship. A fully equipped machine laundry is also provided. Excellent provision is made for the officers and the crew.

Propelling Machinery

The main propelling machinery consists of two sets of single-reduction geared turbines, designed to develop a combined s.h.p. of 18,500 at 125 r.p.m., built by Alexander Stephen and Sons, Ltd., to Parson's latest design.

Each set consists of an h.p. turbine of the impulse reaction type and an i.p. and l.p. turbine of pure reaction type, to which steam is supplied at 400 lb. per square inch and 725 deg. Fah temperature. The blading of the h.p. and i.p. turbines is of the end-tightened pattern, the h.p. blading being Monel metal throughout and the last rows of the l.p. being of stainless iron. All the steam glands are of the labyrinth type, the surplus steam from the h.p. glands being used to pack the l.p. glands. The gland leak-off steam is led to a special gland steam condenser of the builder's make fitted at each gland. By this means it is hoped that the new arrangement will result in a considerable saving of distilled water, and will at the same time improve the atmosphere of the engine room, especially when operating under tropical conditions.

The adjusting blocks are of the Michell type, with screw adjustment for blade clearance on the

h.p. and i.p. turbines. Both the main condensers are of Weir's regenerative design, with a welded steel shell underhung below the l.p. turbine, the weight being carried on four steel springs. The circulating pumps for the condensers are steam turbine driven, supplied by W. H. Allen, Sons & Co., Ltd., of Bedford.

The main control station for the turbines is situated at the forward end, and the main ahead and astern manœuvring valves are of Cockburn's design. A double shut-off valve is arranged on the astern steam wheel to prevent any possibility of leakage.

Steam is supplied by four of the latest Yarrow type boilers, which were constructed by Alexander Stephen and Sons, Ltd. They are, as shown in Fig. 10 of the five drum design, with divided uptakes fitted with balanced valves to direct the gas flow and regulate the superheat, and air heaters with horizontal tubes are incorporated in the boilers. The designed working pressure is 425 lb., with a steam temperature of 725 deg. Fah.

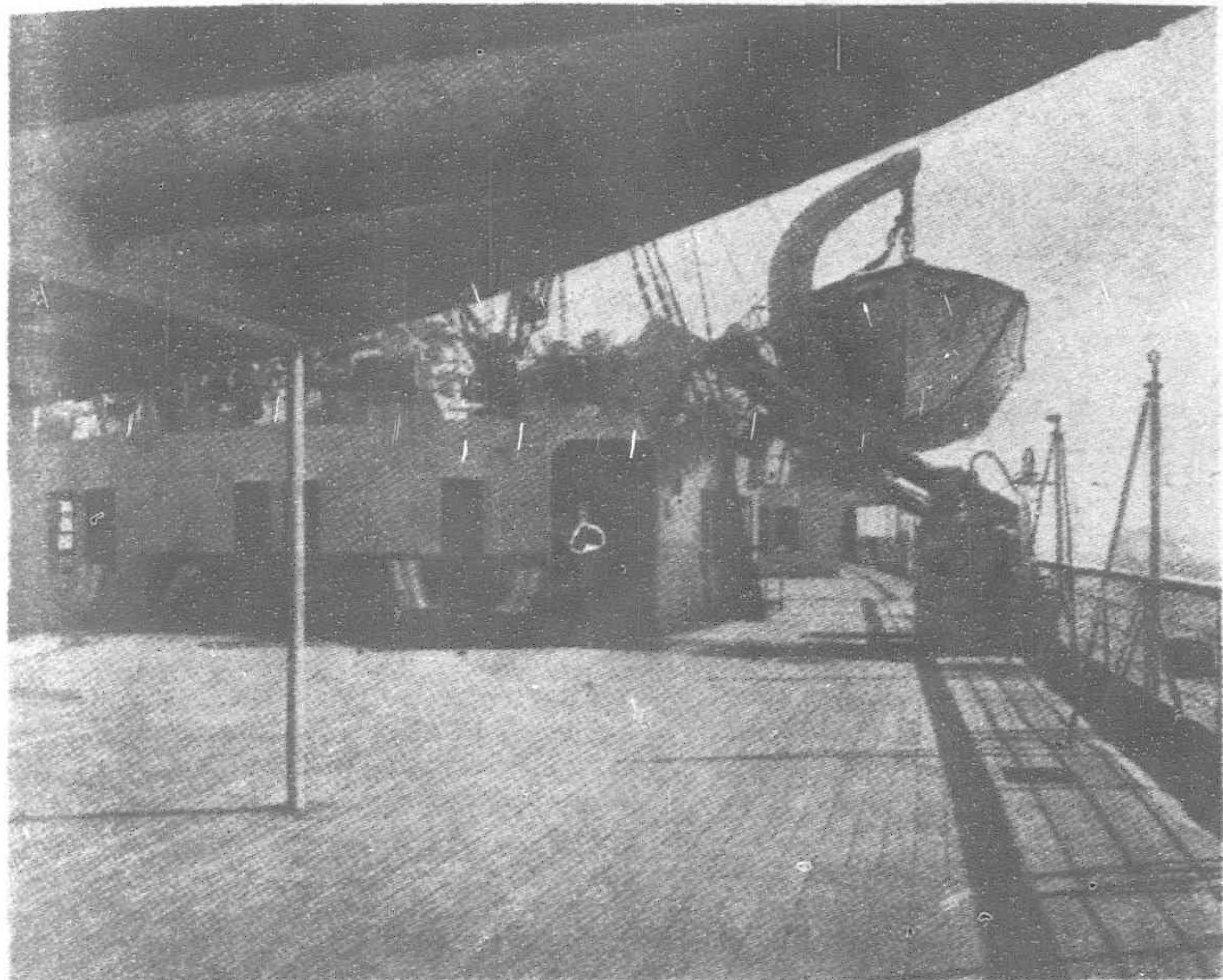
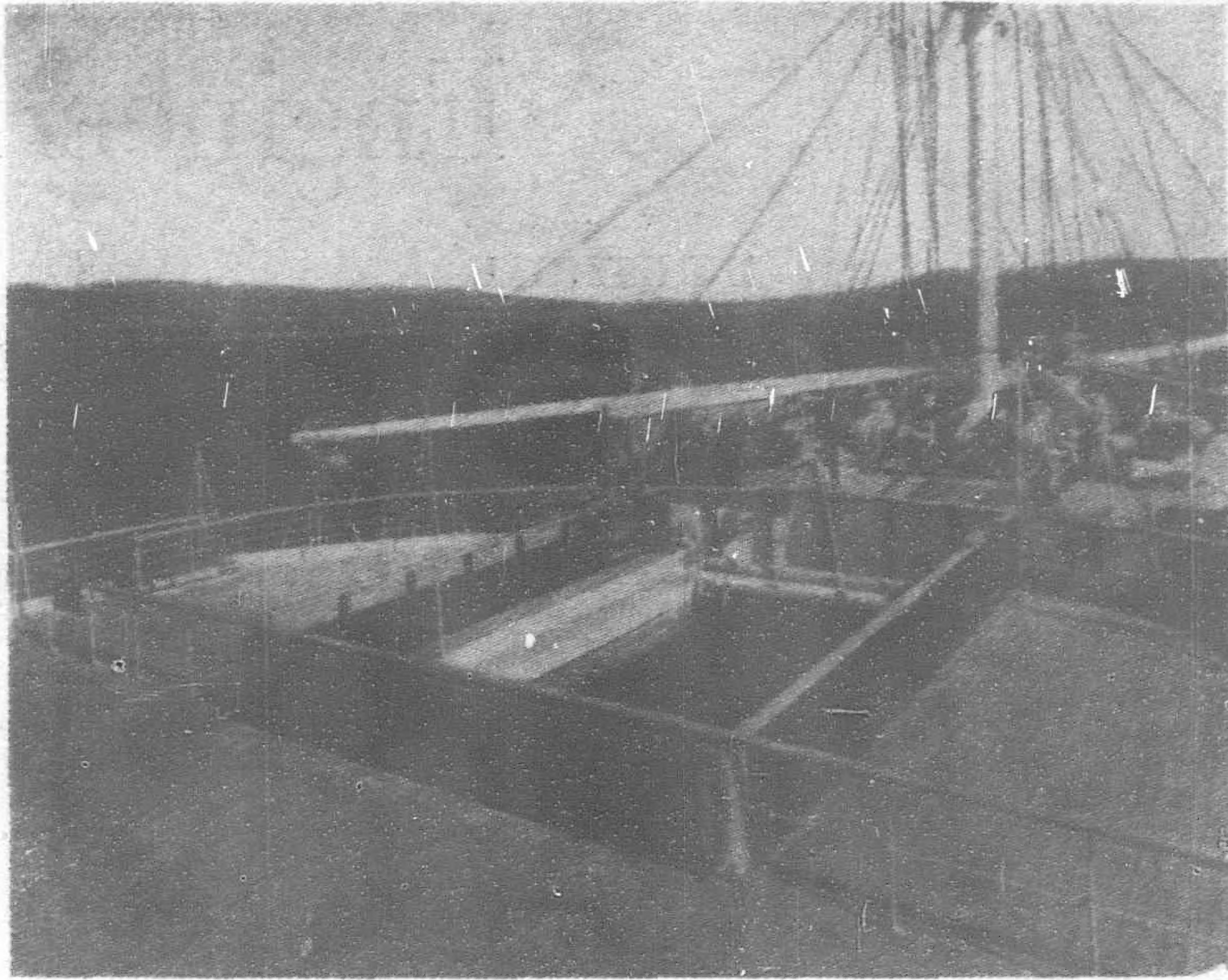
Each boiler has its own electrically driven forced and induced draught fan, the induced draught fan being situated at the base of the funnel, while the forced draught fans are placed on top of the side oil fuel tanks. The usual boiler mountings are fitted, including a low-level water alarm of the "Stephen" type, which cuts off oil fuel from any boiler where the water level has fallen dangerously low. Clyde soot blowers are fitted with extension handles so that they can be conveniently operated from the firing floor. Fig. 10 serves to show the arrangement of these blowers.

Desuperheated steam for ship's services is supplied from two Babcock and Wilcox desuperheaters placed at the aft end of the boiler-room. The oil burning plant was supplied by Clyde Fuel Systems, Ltd., of Glasgow. It consists of two pumping and heating units, each capable of supplying all boilers at full power and, in addition, a small unit for use in harbor.

The temperature of the oil is thermostatically controlled. The boilers are arranged with the drums fore and aft and the oil burning fronts are under the bottom water drum, the pumping and heating plants being arranged in the central passage between the boilers.

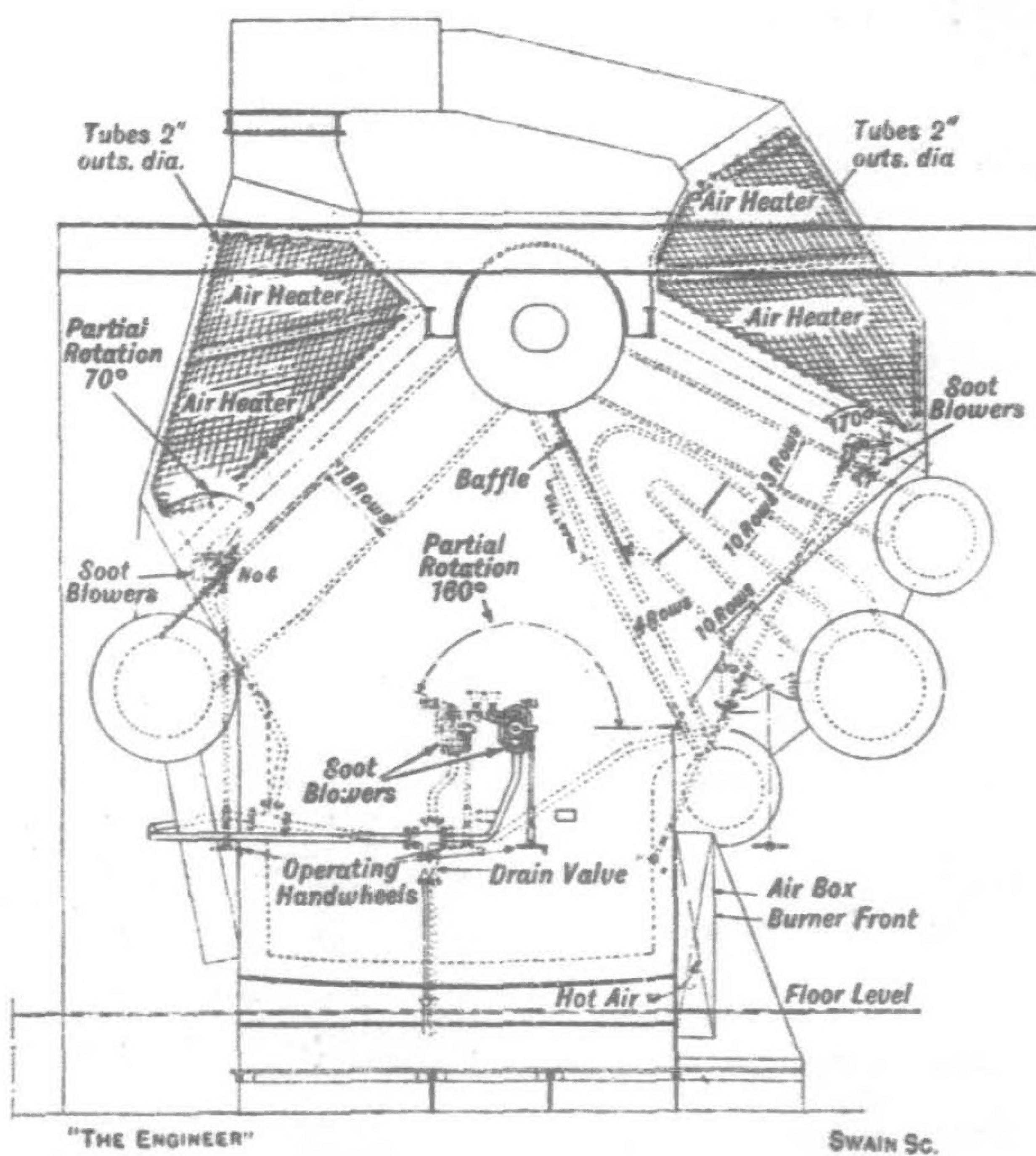


Fig. 7.—First class bibby two-berth cabin on the *Canton*

Fig. 8.—Second class sports deck on the *Canton*Fig. 9.—First class swimming bath on the *Canton*

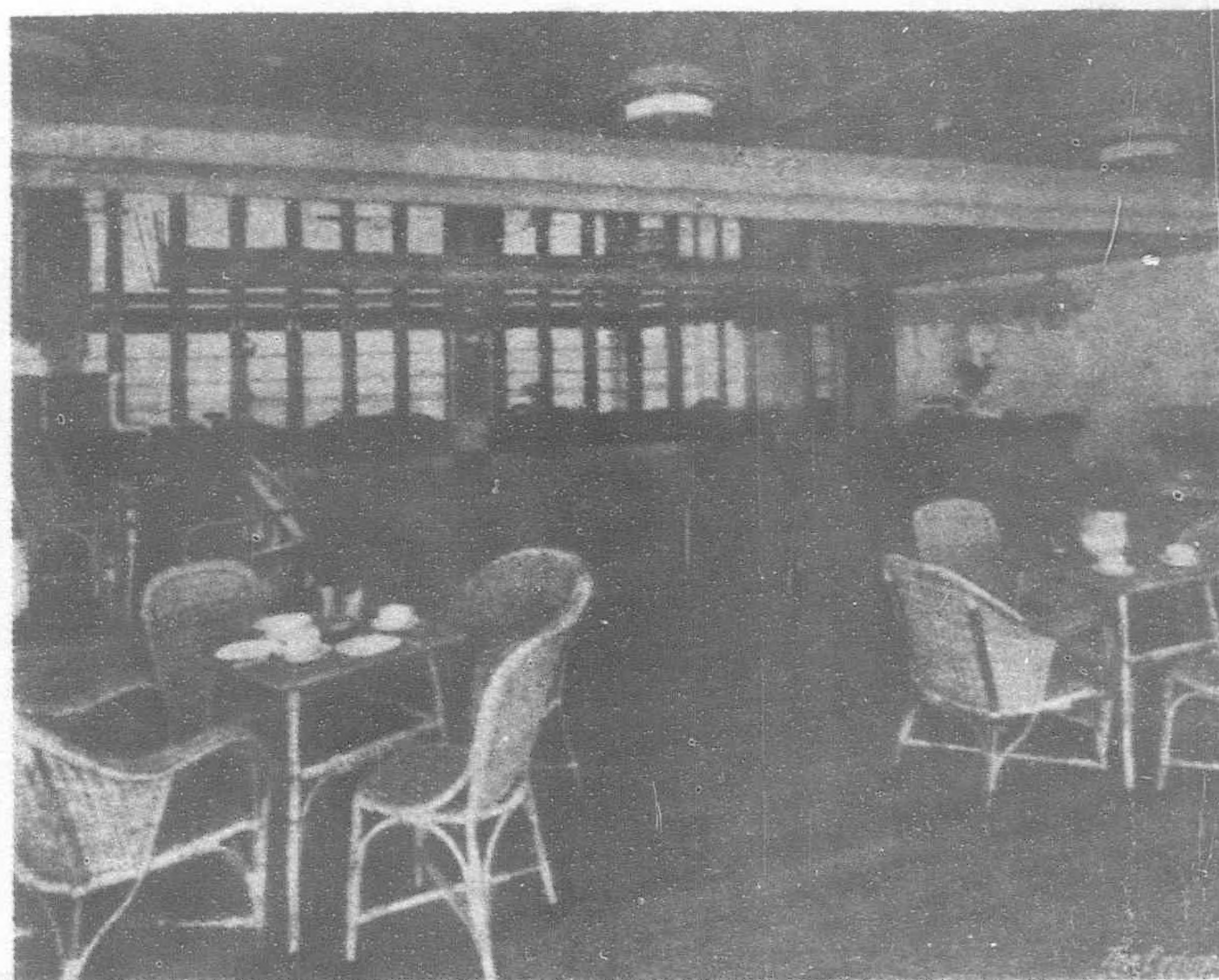
The remaining auxiliary machinery in the boiler-room includes two oil transfer pumps, two auxiliary feed pumps for use in port, one being a steam turbine driven pump and one an electrically driven pump, all of Weir's make, together with a harbor heater and drain cooler. The feed pumps are protected against loss of head by Monitor alarm gear.

Electric current is supplied through the ship by three 450 kw. turbo-generators, supplied by Belliss and Morcom, Ltd., of Birmingham, which drive, through David Brown gearing, the B.T.H. generators. These units are situated on the bottom platform at the forward end of the engine-room and are self contained, each with its own condenser and circulating pump driven on an extension of the armature shaft. Each unit has its own closed feed system with electrically driven extraction pump and steam air ejector, supplied by G. and J. Weir,

Fig. 10.—Yarrow water-tube boiler installed on the *Canton*

Ltd. The closed feed for the main engines, also supplied by Weirs, consists of two turbo-feed pumps and two motor-driven extraction pumps and steam air ejectors, together with three stages of feed heating. The remaining engine-room auxiliaries include electrically driven bilge, ballast, sanitary, fresh water and forced lubricating pumps, all of Drysdale's make.

The switchboards, which were supplied by Whipp and Bourne, of Castleton, are neatly arranged on a platform at the forward end of the engine-room. There is also a narrow deck on each side of the engine-room and that on the port side is arranged as a workshop and store, while that on the starboard side is used for the ship's calorifiers and distilling plant. A complete system of forced ventilation is fitted to both engine-room and stokehold with propeller type fans of Thermotank design.

Fig. 11.—First class verandah cafe on the *Canton*Fig. 12.—First class dancing space on the *Canton*

Engineering Notes

INDUSTRIAL

COMPANIES MERGE.—The Kiryu Machine Manufacturing Company, capitalized at Y650,000, will be absorbed by the Kiryu Precision Machine Manufacturing Company, capitalized at Y1,500,000.

RUBBER COMPANY.—A Nitto Rubber Export Development Company will be established jointly by the Japan Rubber Article Export Guild and the Japan Rubber Manufacturers' Guilds' Federation. Its capitalization will be Y500,000, a quarter paid up. The company will handle exportation of rubber articles.

NEW TOBACCO COMPANY.—The inauguration of the Manchuria Tobacco Company Limited will take place at the end of November in order to adjust the relation of demand and supply of tobacco made of raw material of Manchu products with the five-year plan to increase tobacco production, according to a report from Hsinking.

THE SAKAMOTO LOOM.—The Sakamoto Automatic Loom of the cop-changing type manufactured by Enshu Shokki Kabushiki Kaisha in their factories at Hamamatsu, Japan, is now being introduced in the Indian market by the makers' Sole Agents, Ataka & Co., Ltd., of Osaka, and in India —P. R. Patell & Co., Ltd., Mherwan Building, Sir Phirozshaw Mehta Road, Fort, Bombay.

SYNTHETIC RUBBER.—In a lecture before the Imperial Invention Society, Professor Shu Kambara, of the Tokyo College of Engineering, told his audience that, according to his investigations, Japanese manufacturers are at present not yet in a position to produce such high-grade synthetic rubbers as Buna, Neoprene and SKB, although artificial rubber similar to thiokol is already being made by the Sumitomo Electric Cable Company and some other firms. Professor Kambara stressed the industrial possibilities of manufacturing "rubber-like" substances, which, if mixed with crude rubber, can be used in the manufacture of articles which require no high flexibility and abrasion resistance. Not a few patents for such rubber substitutes (often described as filling matter for rubber) have been applied for or actually been granted.

NEW PULP COMPANY.—The Kokusai Pulp Company will be established in Manchoukuo under joint investment of the Kanegafuchi Spinning Company, the Oji Paper Manufacturing Company and the Kokusaku Pulp Company, according to the *Chugai*. The proposed company is expected to speed the Japan-Manchoukuo rayon pulp self-sufficiency plan. It is to be capitalized at Y60,000,000, half invested by the Manchoukuo Government and half by the above-mentioned three institutions.

ALL-STEEL HOUSES.—Mass production of all-steel houses is to begin soon in the United States. The houses will have walls, roof, and ceiling of sheet steel panels with steel casement windows. The walls may be painted and there will be insulation between the interior and exterior sheets. Research engineers here have announced that exteriors of all-steel houses will at first be available in 20 to 25 designs. The houses may be laid out for four, five or six rooms with additions being attached as desired.

SEEKS U.S. MACHINERY.—Mangyo is going to make a serious effort this winter to obtain machinery in the United States on a credit basis for Manchoukuo's five-year industrial program, according to the *Nikkan Kogyo*. Mr. Yoshisuke Aikawa, president, has ordered Dr. Genshichi Asahara, managing-director, to visit America in his behalf. Dr. Asahara is to sail from Yokohama on December 8. With Dr. Asahara will go several engineers of the Manchuria Coal Mining Company, the East Frontier District Development Company and the Showa Steel Works, all leading concerns under Mangyo's direct control.

MORE CIGARETTES.—The Manchuria East Asia Tobacco Company is to submit an application regarding the projected increase of tobacco production during November this year to the government, based on the Control regulation of important industries. According to the plan, the ordinary producing capacity of 8,500,000,000 cigarettes will be attained, as a result of the establishment of a new factory in Chinchow with producing capacity of 3,000,000,000 cigarettes together with the same quantity of cigarettes at the Mukden factory and 2,500,000,000 cigarettes at the Yingkou factory. The company is also planning to increase its capital to 30,000,000 yuan from 25,000,000 yuan.

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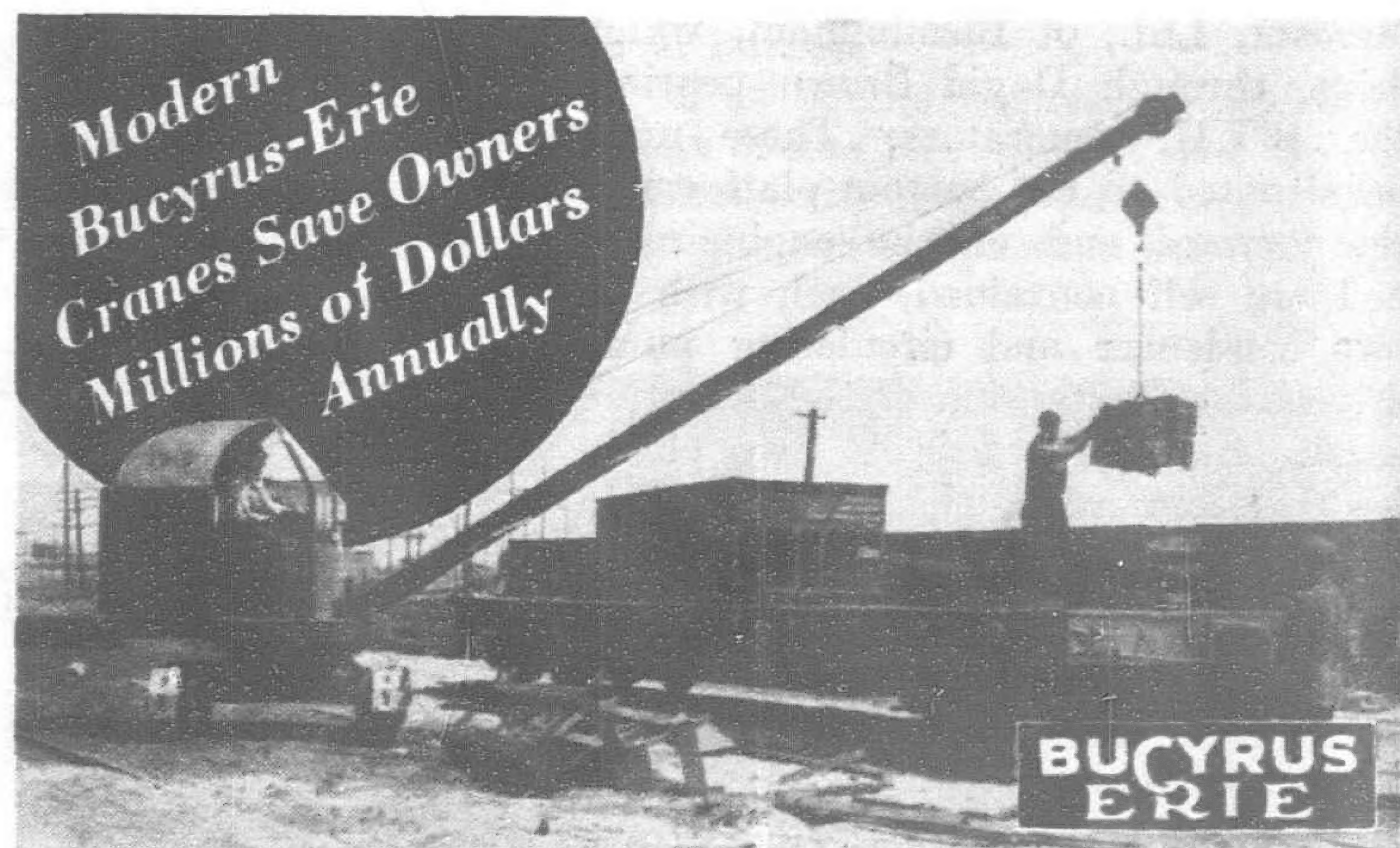
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